THE
AMERICAN ANTHROPOLOGIST.

VOL. IV. WASHINGTON, D. C., OCTOBER, 1891. No. 4.

THE STONE HAMMER AND ITS VARIOUS USES.

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A comparison of stone implements, wherever found, reveals great similarity in them, not only in shape, but also in the method of their manufacture. Local peculiarities, it is true, are often to be observed, but as a rule they are more often due to material than to shape or finish. If we except the Government publications on archæology, and Evans' Ancient Stone Implements of Great Britain, works relating to this subject are, generally speaking, poorly illustrated; outlines are well executed, but the character of work on the implements does not appear to be considered of importance, and as a rule is inadequately shown. In referring to what has been written on the subject I have often been forced, in interpreting the text, to rely on inferior delineations. Moreover, there is often a lack of sufficient information regarding the proportion of the figures to the implements illustrated.

Through the courtesy of the officers of the National Museum I have been enabled to examine a collection of implements from different parts of the world for the purpose of endeavoring to demonstrate the probable function of one implement which appears to have been put to a use different from any heretofore assigned to it, and to be found over a wider range of territory than has been generally understood. There are many kinds of stone hammers, and they are of many sizes—from that of a walnut to the large mauls used in quarries, which were often heavier than a single individual could readily manage. The hand hammer, familiar to all, was probably the tool upon which races living in the stone age relied more than upon any other object to fashion other stone implements. Figure 1 is a typical hammer of

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quartzite from McMinn county, Tennessee, the periphery of which is pitted by use, and the flattened sides show that it has been used as a rubbing stone as well; for not only did the savage rely on the hammer to peck an axe or celt into shape, but it was also used for rubbing or polishing the implement after it had been shaped.

There is no implement more common among the relics of the stone age, none the uses of which have been less discussed by archæologists, and none more deserving of thorough discussion.

An examination of these objects will demonstrate that three types probably contain them all.

First. The oblong or flattened ellipsoid having a pit on one or both sides; the pits probably being intended as finger-holds to relieve the index finger from the constant jar occasioned by quickly repeated blows on a hard surface. The periphery of these will often be found quite smooth, at other times rough, according as it has been last used as a hammer or as a rubber, although hammers of hard and tough material, when used on stone of similar character, wear away on the periphery as though rubbed. Often one or both of the flattened sides show the effect of rubbing, as in Figure 1.

Second. The spherical implement slightly flattened at the poles, showing a battered and commonly a smooth surface. These two types may be considered as common all over the world.

The third type would appear to be the grooved hammer, of the use and distribution of which is less known. This type was evidently intended for hafting, which would interfere with its use as a rubber.

All three types vary greatly in dimensions, but as a rule the two first are of a size suitable for hand use, not only for hammering but also for rubbing.

It is intended to discuss here the hammer used in stone pecking as distinguished from the chipping hammer. By the latter a slower and more deliberate blow would be given, and consequently its shape would not be material.

That nuts and bones could be cracked and paint and grain could be ground with hammers is admitted, but it is contended that no reasonable amount of such work would cause the implements to present the appearance they do if only so used. Moreover, any unshaped stone would have answered these purposes as well as a finished implement; hence, is it reasonable to suppose that savage man would trouble himself to fashion useless objects?

Hammers were made of any hard stone that could be obtained. It is common to find them of diorite, quartzite, or other tough

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material capable of the greatest amount of work with the least wear; they would be gritty, as is almost invariably the case, to grind the pecked surface as work progressed. It can hardly be doubted that men living in an age of stone must have been conversant not only with the best sources of material, but also with its adaptability for particular uses.

As some may doubt whether the stone hammer could do the work suggested, a specimen is shown in Figure 2. It is made of a close-grained black porphyry that in 1878 was pecked out and grooved entirely with a stone hammer by the writer as a first effort to demonstrate the method of axe-grooving. The work on this stone represents approximately five hours' labor. When the hardness of material is taken into consideration, it is safe to conclude that it could not have taken more than one-half as much time to groove an ordinary axe, since they are of much softer material. From this may roughly be calculated the time that would be required to fashion a stone axe or in fact any other stone implement which was made by pecking and polishing; and it will be seen that, granting a liberal allowance of time, the manufacture of stone implements consumed a small portion of the time supposed to be requisite. The statement that the manufacture of an axe or in fact of any other stone implement was a long process has so often been made that it may be regarded as a common belief among archæologists. So great have the difficulties of their manufacture been supposed to be that it has been surmised even that early races had other than stone tools. Among the well known authors who have suggested one or the other of the above ideas may be cited, Evans, Dawson, Bancroft, Lubbock, Southall, Schliemann, Wilde, Kellar, and Wilson, of Scotland; yet all of them must have been familiar with the hand hammer, which is common wherever stone implements are found, as will be shown; and many of the above named authors furnish illustrations of hammers, though they usually call them by other names. Others describe the hammers as objects of unknown uses, or attribute to them uses other than pecking. Jones, author of "Antiquities of the Southern Indians," suggested that they are nut-crackers, and Dr. Rau concurred with him. Stevens in "Flint Chips" suggests their use for flaking by percussion, with which view Nillson appears to agree. Sir John Lubbock doubts whether they really belong to the stone age.

The pecked surface of implements, which differs so greatly from the grooved and polished surface of those made of flint, does not

appear to have been adverted to by more than one or two authors, and the origin of the pecked surface appears to have been left unexplained. In the collection of the National Museum are celts, both pecked and polished, from Sweden, Denmark, France, Switzerland, England, Ireland, Greece, the United States, Central America, the West Indies, Mexico, Brazil, Sandwich Islands, New South Wales, New Zealand, Japan, and India; all of them show the marks of the stone hammer. Figure 3 is a rudely pecked celt of indurated clay slate from Bradley county, Tennessee, the whole surface of which is pecked. Figure 4 is a diorite celt from Yverdon, Lake Neuchâtel, the blade of which is ground, but the rest of the implement shows clearly the pecking process. These two implements may be taken as fair types of stone-hammer work, the one in its rough and the other in its more complete stage.

Schliemann found celts at Tiryns and Mycenæ, and at Hissarlik more than 500 were discovered. Judging from the photographs of these objects as they are presented in "Trojanische Alterthume," they were evidently pecked into shape with stone hammers, of which he found thousands in the four lower cities of Troy.

Dr. C. C. Abbott, in "Primitive Industry," says hammers are supposed to have been used for pecking axes and celts, and also mentions them as rubbers, but appears to think they would readily be broken, and that it would be vain to attempt to determine the particular purpose of all hammers.

The material of which hammers are made varies greatly in hardness, and it would naturally be selected with reference to the particular stone to be worked. In forty-odd hours' work a jasper hammer, in the hands of the writer, showed little wear, although the material upon which it was used was nephrite—one of the toughest of known stones. Quartzite varies in texture. Some of it is almost as soft as sandstone, and again it is almost as hard as jasper. The hammer of hard quartzite is hard enough to fashion a number of almost any sort of implements found on the Atlantic seaboard.

The supposition that a great length of time was necessary to fashion a stone implement gained a certain credence probably from a passage in Lafitau's "Mœurs des Sauages Ameriquains," Paris, 1724. "Hatchets," he says, "have been used over the whole of America from time immemorial. They are made of a pebble hard and difficult to break. They require a great deal of time to make them serviceable. The manner of preparing them is to sharpen them by rubbing them on a sandstone, and to give them, by means of time

and work, very much the appearance of our hatchets, or of a wedge. Often the life of a savage was not sufficient for this purpose, from which it comes that such an article, though rough and imperfect, is a precious heritage to their children."

A large proportion of the Indian tribes were living in a state of savagery at the date of Lafitau's work in America, but the French had occupied a large portion of Canada one hundred years before, and metal must have generally supplanted stone for tools prior to the time of Lafitau. Iron axes and hatchets would have great value to an Indian possessed only of those of stone, and the trade in iron implements must have spread over vast distances. John Smith found at the head of Chesapeake bay, in 1608, articles of European manufacture, which he supposed had come into the Indians' possession by trade with settlers on the St. Lawrence. Lescarbot in 1618 describes the Canadian Indians as being indolent and idle, except in regard to hunting. Lafitau goes further and says of the natives, "Idleness, indolence, and laziness was at the bottom of their character," and he adds that "they passed their time with arms crossed, doing nothing except singing, dancing, and attending their assemblies." These descriptions agree better with the generally received opinion of savage character than those which attribute to an individual of the stone age the patience of a Chinese ivory carver, or even of those more advanced races who first wrought sculptures in hard stone. Captain Cook in his voyage to the Pacific found the aborigines living in a pure age of stone, and traded metal extensively with them; yet upon his return, only two years later, he found that stone tools, which were common at the time of his first visit, had almost entirely disappeared from use and were difficult to obtain. Lafitau's remarks in regard to the length of time necessary for the fashioning of stone implements were evidently made carelessly and in ignorance of the facts, for the necessaries of life were too difficult to obtain to permit a lifetime, a year, a season, or even a month, to be spent in fashioning a hatchet that might be lost or broken by the first careless blow.

One of the best-known implements found in Europe is the bored hammer, called also Thor-hammer, axe-hammer, or Danish hammer. Concerning the external shaping of this implement no suggestions appear to have been made. They are often found roughly pecked into shape, of great symmetry, and are almost invariably bored; frequently, however, they are perfectly smoothed or polished as a celt. Figure 5 is of diorit efrom Sweden, and shows the same char-

acter of work as appears on Figure 3. The whole surface and the hole for the handle has been pecked, yet the method of fashioning these implements has been declared to be inexplicable. Similar objects have been described from the United States, but they must be very rare. They are seldom, if ever, found of flint.

The workmanship of the chipped flint of Europe differs from that of the Thor-hammer and celt of tougher material. Flint implements are almost, if not invariably, chipped or ground; usually both chipped and ground. Flint has a conchoidal fracture, is easily worked, and may be readily chipped into almost any shape. If battered with a hammer, flint will fracture straight through and the implement will be ruined. Figure 6 illustrates a celt of flint from Jutland, Denmark, and exhibits very perfectly the chipping and grinding process by which flint implements were usually worked. Sir John Lubbock, Nillson, Tyler, and Southall attribute the Danish hammer to the age of metal, and the suggestion has been advanced that the hole has been bored with tools of bronze. Though in the two lower cities at Hissarlik, Schliemann found no bronze, he discovered these hammer axes. Their points often present a battered appearance, as though they were used in hammering stone. The heavier class of stone implements, upon a careful examination, will be found to present (flint excepted) a pecked or battered surface, although instances are not uncommon when the hammer marks have been almost, if not entirely, ground away and the surface polished. The blades and thin edges of implements were ground, since blows upon the thin edge would likely fracture it. Figure 7 is a grooved axe of water-worn pebble from Northumberland county, Pennsylvania, showing the natural surface of the pebble, with the groove and part of the implement pecked into shape.

The character of work observable on this class of stone implements is the same all over the world. Whether the objects are from the ruins of Greece or the village sites of America; from the lake dwellings of Switzerland, Ireland, or Scotland; whether it be the axe-hammer of Scandinavia or the celt from New Zealand, Japan, or India; the statues of Central America and Mexico or the sculptures of ancient Egypt and Greece—all present the same characteristic pit-marks, the origin of which has heretofore not been satisfactorily explained. This origin may be explained readily on the supposition that they were made by the hand hammer of stone. It has been suggested that man possessed tools made of a copper alloy with which the stone objects in question might have been fashioned,

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but no such tools appear to have been found. Another suggestion is that the pit-marks were produced by a sharp-pointed stone tool. If so, scratches would be left on soft material, and a hard surface would break the tool. On the other hand, the stone hammer is capable of such work (Figure 2), has actually done it, and moreover is commonly found wherever stone implements are met with. It may be confidently asserted, for instance, that the hand hammer will be found wherever archaic sculpture is discovered, as was the case at Mycenæ. That no special notice of such tools appears in connection with these finds can only be explained, as at Mycenæ, on the ground that excavators have considered the hand hammer as pertaining rather to the domestic economy of the ancients than to the work of sculpture. At Hissarlik, where Schliemann excavated 52½ feet to bed-rock, he describes seven strata, each stratum being occupied by a separate city. Admitting that the accumulation of débris in ancient times was greater than at present, a vast number of years must have elapsed from the date when the first town was settled until the uppermost site was finally abandoned. Objects found at Hissarlik or Troy appear to demonstrate that man, living in the two lower strata was in the very early part of the age of metal, if not in the pure age of stone; yet stone hammers were found in the four lower strata by thousands. Even in the fifth city celts were found, but no axe-hammers. Schliemann describes a grooved hammer, not unlike Figure 2, found only six feet below the surface. This would place it only at the bottom of the seventh city.

Celts were commonly polished, were always graceful in outline, and would naturally be preserved. The hammer is homely at best and is less sought for by collectors; but from an archæological standpoint the hammer tells us more of ancient times than does the celt. It appears singular that archæological authors, as a rule, have paid so little attention to this implement.

The hammer here shown from the third city of Troy, the one from Arizona, as well as those from Switzerland and South Carolina, all evidence by their shape and battered edges that the use of the implement was similar wherever it was met with. It being shown, as in Figure 2, that the pitted appearance on stone implements can be produced by the use of the stone hammer and is not to be distinguished from the work on celts, axes, etc., the only inference permissible is that the methods of manufacture were in all cases the same.

In works on archæology the hammer has received many names, and as many different uses, other than that of a fashioning tool,

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have been attributed to it. The process of its manufacture has also been variously explained. Among some of the names given by writers to this implement are the following: Disc-hammer, hand hammer, chipping-hammer, nut-cracker, milling-stone, grain-bruiser, corn-crusher, mealing-stone, oval-tool stone. Others have included it among the discoidal stones. One says all hammers are bored. Another would call implements of this class hammers if they are not bored. Another thinks the hammer was intended for driving wedges or chisels. Some consider that the pits on the flat surface were made with a punch or chisel. One says the use of the tool is unknown. It is attributed also to the age of metal. Some authors do not apparently consider the stone hammer worth describing. Mansfield Parkyus, in "Life in Abyssinia," says the natives smoothed a grinding stone by pecking with a pebble, which was long and tedious, but produced a tolerably smooth surface.

Whether the author is right or wrong in the suggestion as to the use of this implement as a pecking stone, it must be admitted that the hand hammer is an implement the name, age, and uses of which are a subject which has caused a great diversity of opinion. Found alike in the caves of England and the continent, in the lake dwellings of Europe, in the dolmens, in the lowest strata of Troy, or on the village sites of recent savage races, it may be considered a universal tool, used by man through all ages—a cutting and probably a polishing tool as well.

The celt or axe, as well as the pestle and the beautiful discoidal or hammer stones, may be pecked into shape by means of the hand hammer, and its use is apparent on more than one stone pipe; the same pecking-marks are visible on the statuary and carvings of America and Greece and Egypt. When surfaces were to be cut the hammer sufficed for the work, even were the stone so hard that a steel tool would have been useless. A vast majority of the heavier stone objects present evidence of the peculiar work of the hammer—possess grooves and have few if any angles. The same implement after being used to shape the stone would smooth and even polish its surface. Copper was employed by the American Indians as a stone. Being malleable, it was battered into shape, and all early travellers on this continent found it common among the Indians. It may even have been used on very soft stones as a cutting tool.

The stone hammer of the middle Atlantic coast appears most commonly to have been made on a tough, compact and fine-grained

quartzite. Though softer stones were used, doubtless, when soft material was to be worked, jasper, which will work any stone of which implements were made, was probably also employed. The wear on the hammer depends largely upon the material worked, and in selecting the hammer, it may naturally be supposed the workman would consider this.

The writer began the study of this subject in an effort to demonstrate the manufacturing of a grooved-stone axe. It was then observed that the surface marks of the celt and the discoidal stones indicate a similar method. The ceremonial implements also, and even certain of the bird pipes, presented a similar class of work. Finally an examination of the collection of the National Museum was made, and it was observed that the Mexican and Central American carving presented the same surface indications, allowing for difference of material, as the celt and axe. There appeared to be but one inference, and that was that the process of manufacture was similar, and that the tool was the same in each instance. The hammer was the only tool known to the writer that would produce such results, and experiment has shown that the hammer could produce them.

To return to the process employed by the ancient sculptor: In the National Museum there are but few statues, and they are from Central America. A careful examination of these objects reveals the same pecked surfaces observable on celts and other small implements. All the work on these sculptures could readily be done with the stone hammer. The material of the sculpture is a volcanic tufa, and had an implement like the chisel been used it is submitted that lines would be visible indicating the employment. Such is not the case, for pecking only appears on them.

Egyptian sculpture of the earlier dynasties also seems to show the same character of pecking that is visible on the sculptures of America. In both classes angles are quite unusual, while curved lines and grooves are frequent. The same may be said of ancient Greek sculpture. If man has gradually advanced from a very low stage, and the hammer can be shown to have been the fashioning tool of early man, would not it remain so until a superior material became available? The engraving of the tablets found at Mycenæ, as illustrated in Schliemann's work, appear to indicate also the same general character of work as is seen on the Central American sculptures. As appears from the pit-marks on the surfaces, the furrows are all curves—in fact, every detail of manufacture can be explained on the theory that they were made by the stone hammer, numbers of

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which were there found. Going further than this, however, it can be shown that the early Egyptian sculpture, probably as recent as the 20th dynasty, was more likely produced by means of the hand hammer than with any other implement, notwithstanding the theory of Mr. Emil Soldi, president of the section of the history of art of the Numismatic and Archæological Society, in his work "La Sculpture Egyptienne," Paris, 1876, who claims that iron and steel were the implements of ancient Egyptian sculpture. He says we are reduced to hypothesis concerning processes employed by artists of the Nile, and causes which have impressed on its sculpture its general character, that savants have attributed fabulous methods far from the real facts; that the explanation of the Egyptians working the hardest materials—granite, basalt, and diorite—was due to youthful determination in them as a nation; it was principally these materials, he says, which accounted for their sculptures being so impressive and remaining of an architectural character. Material and process had immense influence on art. Egyptologists have imagined peculiar processes of sculpture, but he imagines methods similar to those of the present time, and suggests the pointing tool as the implement used not only to cut and reduce the block, but to fashion the hair and produce the broken and irregular lines apparent on the sculptures of the Louvre. He further suggests the marteline or double-edged pick or hatchet as of frequent use in Egypt, and remarks that there are no evidences of the use of the chisel at an early date, and calls attention to the rose granite sphinx of the Louvre, and says the polish has not worn away nor the fractures of the point which did the modeling. He says Mr. Wilkinson claimed the Egyptians did their work with a bronze chisel—one of which was found in a quarry of soft Theban stone. Mr. Soldi claims that the work was done with iron or tempered steel. Iron, he says, was known to the Egyptians, and he accounts for its disappearance by the presence of nitre in the soil. He shows that elegance and grace first appeared in the statuary of the 26th dynasty, and that a peculiarity of the ancient design which represented the four fingers of the hand of equal length, divided longitudinally by striæ. In Mr. Soldi's work are presented two engravings of Theban painting, the one representing a sphinx, the other the statue of a man, in each of which are individuals polishing the sculptures with discs; there also appear figures with objects in their hands, with which they seem to be hammering the figures. These illustrations are referred to as having peculiar significance in considering the question

of the use of the hand hammer in carving. There is nothing in Mr. Soldi's argument that will not apply with equal force to the small Mexican statue illustrated here. Upon it may be seen similar pit-marks, and the work is of the character he describes. The head has been broken off the neck of this figure, which is unfinished; the pecking is as plain as on Figures 3, 5, and 7. The pose and design of this statue may be rude, but it is certainly equal, if not superior, to a vast majority of the ancient statues of Egypt. Every expression used in describing the pitted surface of Egyptian statuary has been employed by one author or another in describing celts or axes.

Ancient man in America was not possessed of iron or steel, nor of other hard metal, yet he fashioned discoidal stones, ceremonial weapons, animal pipes and figures with stone hammers, any of which required more delicate manipulation than did the Egyptian statuary of antiquity. Can it be claimed that the Egyptian was the inferior of the Indian in producing statuary, both being possessed of the same working tool? The bottom of the Homeric city of Troy was but thirty-three feet below the surface of the hill of Hissarlik. In this city bronze was found. Ten feet above was the surface of the burned city. Thus we may safely say that one thousand years before the Christian era man fashioned tools of bronze; that there were found also stone celts of beautiful shape and pestles of stone, both probably fashioned with the stone hammer. Twenty-nine feet deeper than the surface of this destroyed city, nearly on bed-rock, Schliemann found gold, lead, and copper that had been worked. Here also he found stone hammers by the thousand, celts, pestles, discoidal stones, and the Danish bored axe. All these articles required skill to manufacture, and in other countries in a like stage of development were contemporaneous with rude carving. Who can at present suggest the number of centuries that were required for the accretion at Hissarlik of twenty-nine feet of detritus? Who with our present knowledge would attempt to venture a suggestion as to the period of time that had elapsed prior to the founding of this lower city, since man first fashioned implements with a pecking hammer and rubbed them smooth, partly at least, with the same implement.

The contention in favor of the use of iron and steel or bronze in fashioning celts or statuary of diorite cannot be maintained. The stone hammer, in a part of the world at least, was used in shaping tools and figures of stone. Is it not a permissible inference that

this was the carving tool, not only of the age of stone, but through it to that of bronze, and even to a later period, until iron came into comparatively common use? Then and then only would stone begin to be supplanted by the iron carving tool and sculpture show signs of advance; even then, however, first in the softer stones.

We may well imagine that the hammer first used for chipping would soon be employed for pecking the rudest implements. The latter in turn would be fashioned with more care, until in time it would become possible to shape the rude outlines of man and beast. The oft-advanced theories of softening the stones intended to be worked, of diamond drills, of hardened copper, of tempered steel, in the possession of the Peruvians or Egyptians, are not supported by facts, and must give way in favor of the tool all early races possessed, the hammer stone, which can readily be shown to do any work on stone implement or carving and to do it well and rapidly.

The views here set forth are supported by the experience of many years in the collection and study of implements, as well as by experiment. Whether or not they are accepted as sound, it is believed that an intelligent discussion of the subject by archæologists will advance our knowledge of man in the age of stone. The method of the manufacture of pecked implements has been declared to be one of the mysteries of archæology. It is hoped that the mystery is here at least partially solved.

FIG. 1—The pitted stone hammer.

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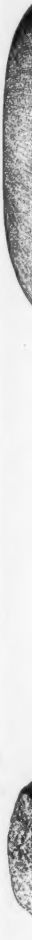
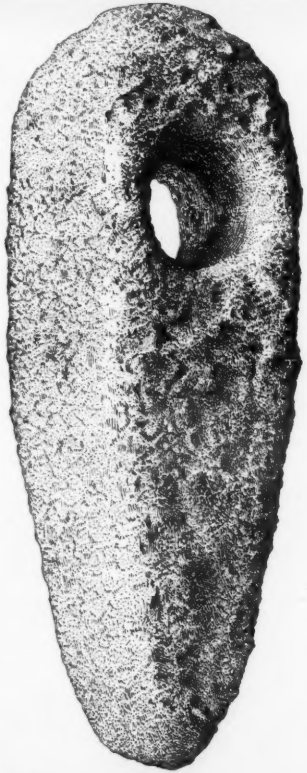
PLATE I. FIG. 2. FIG. 3. FIG. 4.





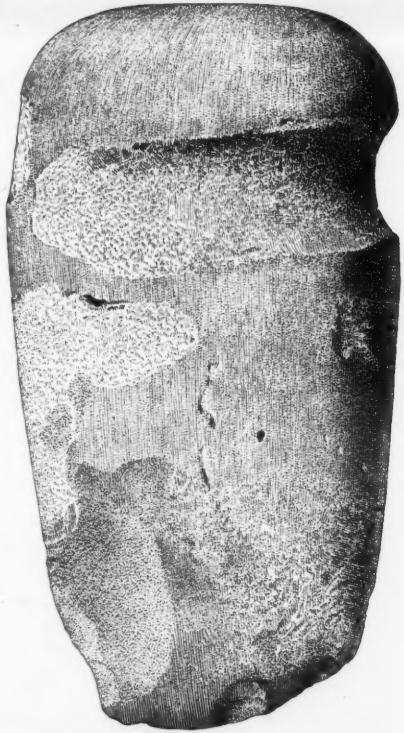
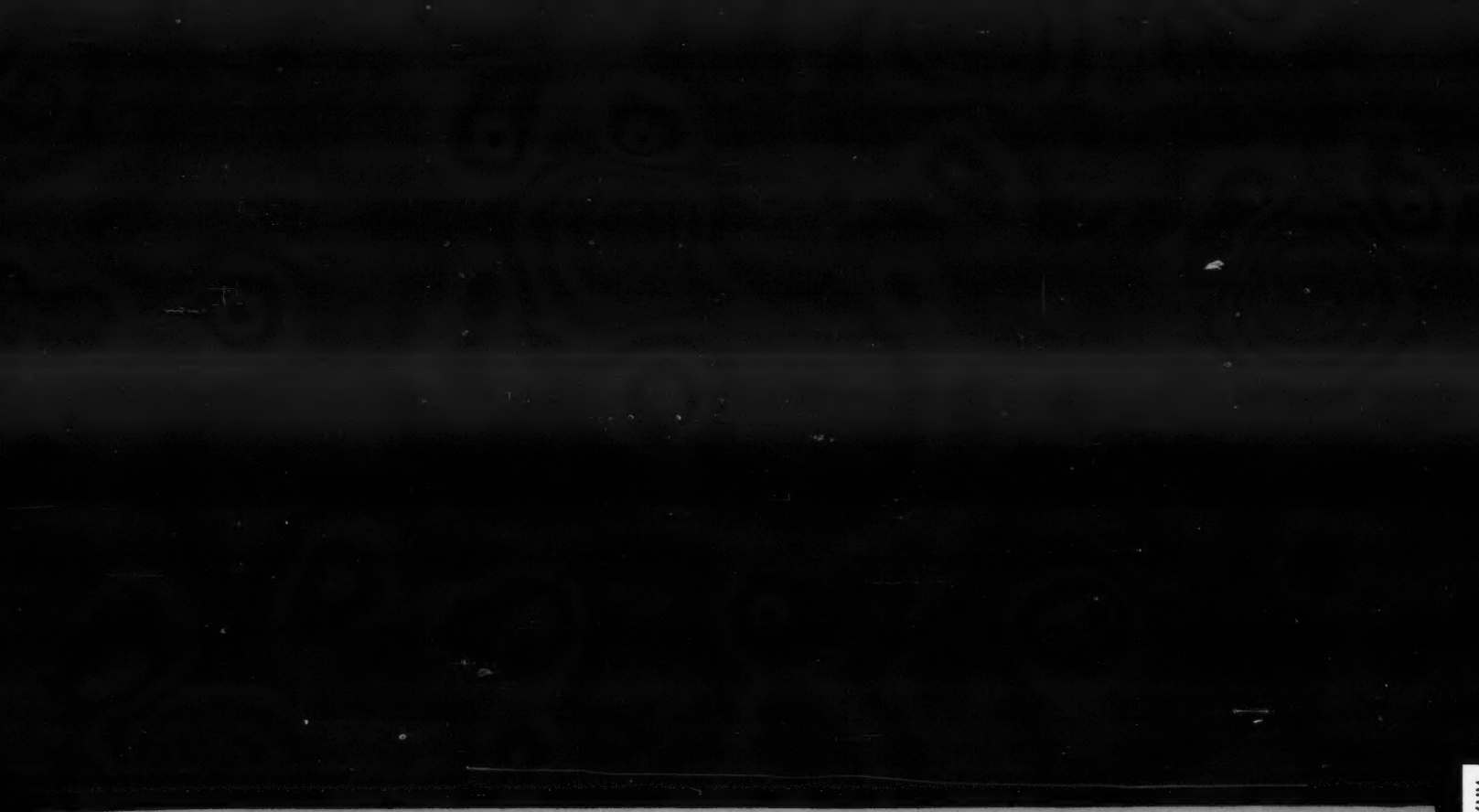


PLATE II. FIG. 5. FIG. 6. FIG. 7.



ABORIGINAL NOVACULITE QUARRIES IN GARLAND COUNTY, ARKANSAS.

BY WILLIAM H. HOLMES.

In the State of Arkansas, and extending from near Little Rock to the western limits of the State, is a broad belt of highland made up in great part of a peculiar species of rock known as novaculite. This rock closely resembles chert and flint in character and appearance, but is more attractive to the eye, and on account of its purity and massiveness is more conveniently worked. It occurs in strata, often 50 to 100 feet in thickness, interbedded with silurian slates, sandstones, and quartzites, and outcrops nearly continuously for many miles at a time. Certain varieties of the rock are now extensively quarried for whetstones, as is shown in the report to the 11th Census by Mr. L. S. Griswold, of the Arkansas Geologic Survey. The more flinty or glassy varieties were quarried extensively by the aborigines in past centuries, and employed by them in the manufacture of flaked tools and projectile points and, to a limited extent, of polished tools. The appearance of the rock is most attractive, passing as it does from translucent and milky forms resembling agate into all shades of delicate reds, yellow, grays and blacks. Forming a large share of the exposed rock of the region, erosive agencies have broken it up extensively and have distributed the worn or partially worn fragments over the slopes and along the stream courses. Everywhere the aborigines found and worked these transported masses, and hundreds of square miles are strewn with flakes, fragments, failures and rejected pieces, and the country around, from the mountains to the gulf, is dotted with the finished forms that have been used and lost.

The natives did not stop, however, with the utilization of detached and transported masses. Not finding upon the surface material in suitable quantities, they essayed to quarry it from the hills, and the recently discovered evidences of this work are of unusual interest. The quarries surpass in extent any similar achievements of the aborigines in this country, if not in America.

The quarries are numerous and widespread, but the whole class may be illustrated by a single example, which, though not the most extensive, is unsurpassed in its interest. The example referred to is a group of quarry pits located on the crest of a high forest-covered ridge about three miles east of Hot Springs, Arkansas. The evidences of ancient quarrying consist of a number of pits and excavations dug in and about the crest of the ridge. This ridge is a solid formation of the novaculite weathering out in irregular grayish flinty-looking masses which protrude from the crest or project on the slopes, forming short broken cliffs from ten to twenty feet in height. When we come to realize the true character of these rocks, their slight outcrops, their massiveness and flinty texture, we marvel at the courage of the workman, who with rude stone tools and wooden pikes essayed the work of quarrying; but the beginnings were probably small and the progress of the work so gradual that the workmen did not realize the difficulties that seem so apparent to us.

The largest excavation as seen to-day is on the crest of the narrow ridge near the highest point. It is almost circular and about 150 feet in diameter. The rim of the conical depression is irregular, being higher at the center of the crest of the ridge and lower at the sides. The greatest depth is about 25 feet. On the east side the rim is broken down as a result of the digging of a large pit on that side of the crest. The process of excavating this great conical pit has been, no doubt, about as follows: An outcrop of particularly desirable rock was discovered upon the surface. Gradually it was worked down and followed beneath the surface. The process of uncovering the ledge and breaking up the rock was most tedious; the latter was accomplished by means of hammers, aided by the use of fire. As fragments of suitable size and quality were obtained they were thrown or carried to the margin of the pit, and broken up and trimmed into approximate shape for the desired tools, and the refuse gradually formed heaps and ridges about the excavation. At the present time the enormous accumulations of this refuse have descended upon the interior of the mine, partially filling it, and upon the exterior form slides of broken bits of the richly colored rock, reaching far down the slopes of the ridge. This encircling wall of refuse is composed greatly of partially shaped fragments, all indicating the intention to produce leaf-shaped blanks or blades, suitable for final specialization into spear or arrow points, or knives, scrapers, or like tools. Hundreds of tons of these failures could

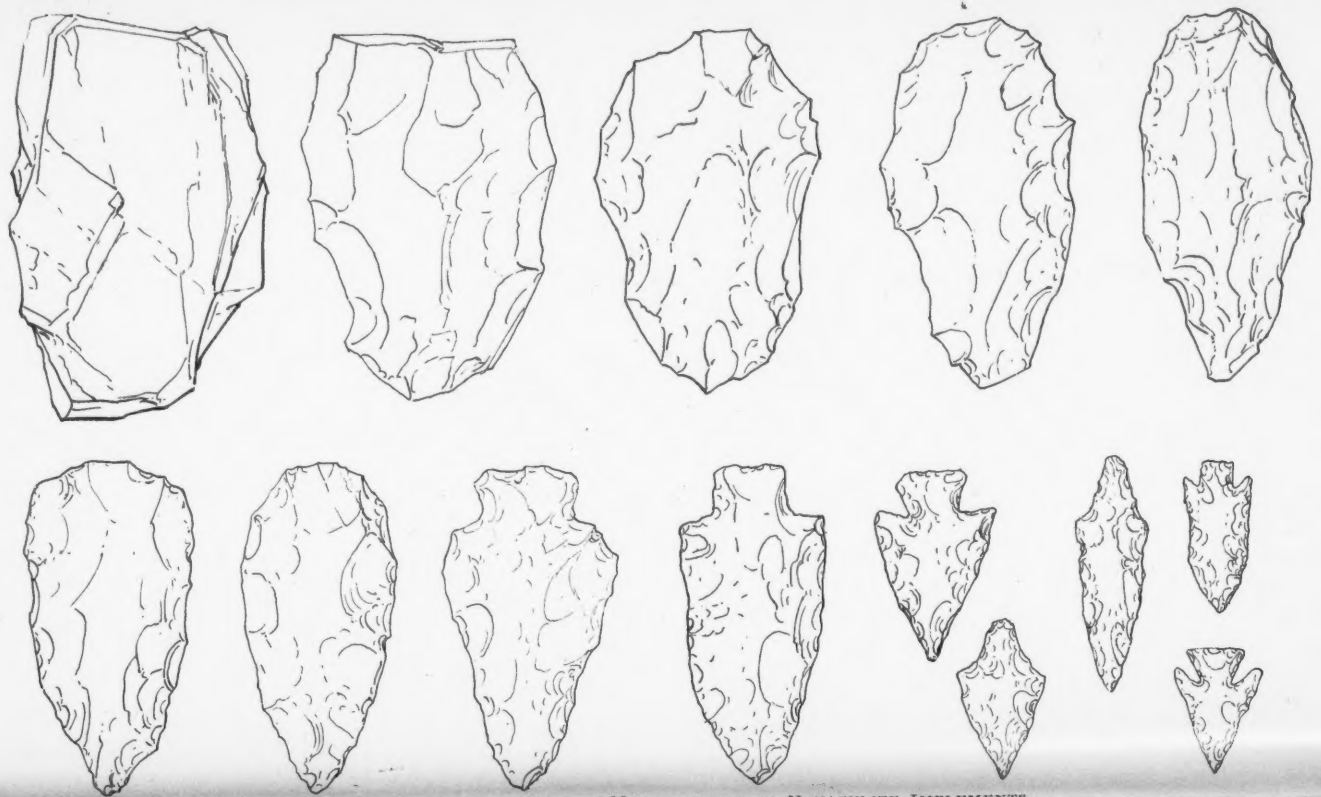


PLATE III.—Series Illustrating Manufacture of Novaculite Implements.

PLATE III.—SERIES ILLUSTRATING MANUFACTURE OF NOVACULITE IMPLEMENTS.

be collected, and freely intermingled with them are the rude hammers of quartzite made by slightly reshaping bowlders of tough quartzite from the valleys below. This particular pit was entered by the whites in recent years and a shaft was sunk in the center for the purpose of determining whether or not the rocks contained gold or other precious metal, for it was popularly believed that these pits were old Spanish diggings where the early adventurers obtained the fabled gold. It would seem that a very slight experience with the barren flinty novaculite must have discouraged the unlucky prospectors, for little was accomplished. Some of the shaft timbers are still in place in this pit, and the careless observer might readily be led to believe that the excavations were wholly due to modern enterprise. That the recent work has not seriously changed the contour of the ancient quarries is evident from the fact that the entire mass of ejected material, interior and exterior, is composed of the partially shaped fragments derived from ancient flaking.

Connecting partially with the main pit and on the south side is another pit, larger in area, but less regular and not so deep. The symmetry of the basin is interfered with by a series of masses of gnarled rock not removed by the quarrymen. Other smaller excavations occur on the crest north and south of these, and a good deal of work has been done at the sides, especially at a point directly beneath the main pit on the east. Photographs were taken, but fail to give a clear notion of the phenomena of the ancient quarries.

Evidence of the use of fire in quarrying is found in some of these lateral diggings, where there has been undermining. Here certain faces of the novaculite, protected from the weather by overhanging ledges, still retain the blackened patches left by the fires. The freshly quarried rock was carried out of the pits to be worked. High ridges of refuse, marking the favorite positions of the flakers, encircle the pits, but much work was done on all the level spots about the crest of the ridge. The refuse is identical with that of similar sites in other parts of the country. It is like that of the quarries of the District of Columbia, insomuch as it contains no fragments or pieces indicating that more than the merest roughing out was done on the spot. Like the District of Columbia sites, this was in a wild region and some distance from habitable spots.

A series of the quarry shapes is given in the upper line in plate III. The lower line illustrates blades and specialized forms obtained from sites in the neighboring valleys.

Other similar and even more extensive quarries are found at other

points in the novaculite areas. One was visited by Mr. Griswold in 1888 and by Mr. Jenny, of the U. S. Geologic Survey, in 1891. At my suggestion the latter made collections of quartzite hammers and worked pieces of novaculite and forwarded the interesting notes which follow.

ANCIENT NOVACULITE MINES NEAR MAGNET COVE, HOT SPRINGS COUNTY, ARKANSAS.

BY W. P. JENNEY.

These old excavations are located on the top of the divide between the waters of Cove creek and Pleasant run, a branch of Ten Mile creek, about twelve miles east of Hot Springs. They consist of a number of shallow excavations upon the broad, rounded crest of the divide, covering a belt three hundred to six hundred feet in width, the workings following the general strike of the novaculite rocks at this point, to wit, N. 60 degrees to 70 degrees E. As far as I followed the divide—for a distance of one and a half miles—these workings continued, and are reported to extend, with breaks at intervals, an extreme distance of four miles southwesterly from this point. They are at present covered with soil and overgrown by oak timber of ordinary size. The excavations are nearly filled by the caving in of the loose waste from the surrounding dumps, but were evidently worked to a depth of fifteen to thirty or forty feet, apparently, as open cuts or trenches, following the purest and most valuable strata of the novaculite. Some are one hundred to three hundred feet in length, but the greater number of these workings consist of shallow pits twenty to fifty feet in length, probably ten to thirty feet in width originally, before caving, and fifteen to twenty-five feet deep, being opened at intervals irregularly along the course of the layers of the novaculite most useful to those doing the work.

The whole ridge is composed of novaculite, with a strike N. 65 degrees E., dipping south at fifty to sixty degrees. Most of the novaculite is coarse-grained, impure, and unsuitable for the manufacture of implements. On the crest of the divide several beds of novaculite outcrop, which are of very fine quality and are interbedded with the coarser strata. These pure beds are from five to twenty-five feet in thickness. The rock is white, yellowish, or bluish white in color, breaking readily with a smooth conchoidal fracture.

The range is broken in places by cross-ravines and low saddles. In one place a small brook flows nearly at right angles across the formation, exposing the upturned edges of the novaculite belt forming the crest of the divide, and the strata of pure rock are seen to be in line with the excavations on either side of this brook, while interbedded impure strata underlie the waste dumps intervening between the lines of excavation, showing conclusively that the old workings follow the beds of pure novaculite. The whole surface of the ridge in the vicinity is covered with chips of pink, red, or white novaculite, rarely dark-colored or black, and always having a fine-grained structure. The pure white agate-like novaculite being evidently the most worked and sought for, the waste dumps show that coarse-grained, impure, and much-fractured rock was discarded. Many of these flint chips show serrated edges, as if discarded after an attempt had been made to fashion an arrow head or cutting tool.

The tools used by these ancient miners appear to have been balls of stone or natural bowlders of three sizes, the smallest one and a half to two and a half inches in diameter, the second size three to four inches, and the largest six to eight inches in diameter; these bowlders or stone hammers are mostly dark grey syenite; some bowlders of hard igneous rocks as well as hard quartzite of grey and brown shades of color. None of these rocks occur in the ridge, these bowlders being evidently brought from the beds of streams draining the area covered by the eruptive rocks to the southeast, the nearest localities from which these tools could have been obtained being some two miles distant.

None of these stone hammers show grooves whereby they were attached to handles. Many fragments of broken hammers lie in the waste dumps, especially of the larger sizes which would be most frequently broken in working, the smaller being used probably in trimming the fragments of novaculite after they were quarried. Some of these stone hammers, especially in the more recent workings, are smooth and imperfectly polished, but the older dumps contain fragments of bowlders of granite and other igneous rocks which have undergone considerable decomposition since they were broken in use. Hard crystals of feldspar project from the surfaces of these ancient fragments by the action of weathering, and even the fractured surface of the broken bowlders is similarly weathered. These stone hammers are abundant in the old dumps, although large numbers are reported to have been carried away by former visitors. The

workings have evidently been made at different periods of time, some, evidenced by the weathering of the novaculite chips and the stone hammers, must be very old. In the extent of one and a half miles examined on the crest of this divide I would estimate the aggregate quantity of material which must have been excavated at 100,000 cubic yards. The neighboring ridges are covered by pine timber of good size. In the vicinity of the workings the timber is oak and resembles second growth. This may have resulted from the timber being destroyed by the ancient miners either for domestic purposes, or possibly for fire-setting in mining the novaculite.

PHYSICAL CULTURE IN CHINA.—The ingenious contrivance which the Ojibwas have for strengthening the muscles of the legs by wearing small bags of shot about the ankles, mentioned in Dr. Hoffman's "Remarks on Ojibwa Ball Play" (Amer. Anthrop., April, 1890, p. 133), recalls a similar custom among the Chinese.

A good many years ago, when I was living in the south of China, and working hard to acquire some knowledge of the language, I had a teacher who was an intelligent man, one of the lowest rank of the literati.

He used to delight in telling me about the wonderful feats of strength and agility performed by his brother, who was, according to *Lio siu tsai*, a mighty athlete in every way, but whose specialty was the high jump. I inquired by what course of training his brother had attained such remarkable power. He said that his brother first acquired great strength and flexibility of his leg muscles by squatting down until his haunches touched his heels, and then slowly raising himself until he stood upright on his toes; he would also, from the squatting position, spring up into the air as high as he could. His next step was to practice jumping until he could gain nothing more. Then he began to jump with small weights fastened to his feet; these weights were gradually increased until, with a weight of five catties (about 6⅔ lbs.) on each foot, he jumped as high as an ordinary man could. "Therefore," Lio wound up triumphantly, "when he took off the weights and jumped with all his power, he soared up into the air like a bird!"

Although my teacher's figures may be open to criticism, I do not doubt that his brother *did* use the weights, thinking to derive some benefit from such training.

AN EXPERIMENT IN HUMAN STIRPICULTURE.

BY ANITA NEWCOMB MCGEE.

"Stirpiculture: the breeding of special stocks or races," is Webster's definition. The breeding of animal stocks is familiar to all of us, but human stirpiculture is so nearly unknown that even its possibility has been denied. Whether this be true under ordinary social conditions remains yet to be seen, but I wish to lay before you proof that it is not wholly unattainable in our own time and land. A systematic and carefully executed experiment in human stirpiculture was made at the Oneida Community, in central New York, from 1868 to 1879. To explain how this came to pass requires some account of the man who planned the experiment and of the path which led to its inception and partial consummation.

John Humphrey Noyes was born in southern Vermont in 1811. Of strongly religious inheritance and training, he was also possessed of a logical and independent intellect. While a student of divinity at Yale, in 1834, he originated and preached certain doctrines not in accord with Congregational tenets, which caused his expulsion from that church. The most important of his distinctive teachings were that the second coming of Christ took place at the time of the destruction of Jerusalem, when the members of the primitive Christian church, whether living or dead, became immortal and formed a church in heaven, of which the church founded by Noyes was a continuation. Since that period "personal communication with Christ is a privilege of the gospel, and when this communication is perfected it will ensure salvation from sin, including disease and death."* In consequence of their desired freedom from sin, the adherents of these doctrines are called Perfectionists.

After the return of Noyes to Putney, Vermont, where several members of his family and a few other persons lived under his care, he slowly devised means for the growth and perpetuation of the new sect. A system of community of property among those believers

*American Communities, by William Alfred Hinds, Oneida, N. Y., p. 125, 1878.

who were able to live and work together, seemed best adapted to the end in view. Noyes, however, clearly saw the inevitable conflict between that new unit, the community, and the old unit, the family. He himself says on this subject: "Love in the exclusive form has jealousy for its complement, and jealousy brings on strife and division. Association, therefore, if it retains one-love exclusiveness, contains the seeds of dissolution, and those seeds will be hastened to their harvest by the warmth of associate life."*

Prophetic words! For Noyes made the mistake of his life when he concluded that man is not naturally monogamous. He argued from the Bible that in the kingdom of heaven there is no marriage, since marriage is like slavery—a form of selfish personal ownership; and to overcome this selfishness among Perfectionists, Noyes devised an extraordinary system of regulated promiscuity, beginning at earliest puberty, and by a method of his own invention he separated the amative from the propagative functions.† By this community of possession and of person he sought to root selfishness forever from the hearts of his disciples.

The first feature was practiced on a small scale from 1841; the second—"complex marriage"—was inaugurated in 1846; but the other inhabitants of the New England village refused to view matters in a lenient light, and they showed their sentiments in no uncertain manner.

Having left their home in consequence of this, the growing sect established itself, in 1848, with some of Noyes' adherents who lived near Oneida, N. Y. At the close of this year the Oneida Community included 87 persons. The succeeding year it doubled its numbers. Financial success was of course its first necessity, and twenty years of hard labor and earnest effort brought prosperity. The membership during this time was carefully limited, so that in 1869 it had increased only to about 250.

Previous to this date it was deemed desirable, for financial and other reasons, to restrict the birth-rate also. New members, of course, brought their children with them, but only two or three

* History of American Socialisms, by John Humphrey Noyes, Philadelphia and London, p. 634, 1870.

† See Male Continence, by John Humphrey Noyes, Oneida, N. Y., 1872, and article on A Gynecological Study of the Oneida Community, by Ely Van de Warker, M. D., in the American Journal of Obstetrics and Diseases of Women and Children for August, 1884.

were born in the community each year. So well under control was this matter that only about one birth in eighteen months was accidental. The remaining births were from mothers who, for personal reasons, had obtained permission to increase the population of the community.

Now all this time Noyes was the leader and the undisputed head, who, by his personal power and attraction, had drawn together and kept together this group of people; but the great object of his creed, namely, salvation from sin, disease, and death, could not wholly be accomplished in one lifetime. Therefore, the immediate necessities being obtained, it was to the future and to the next generation that Noyes now turned his attention. It was a self-evident matter to him that for the attainment of his object each generation must surpass the preceding one in holiness, and to accomplish this he devised the method of stirpiculture practiced by the community.

Its first principle, founded on stock-raising experience, was that of a judicious in-and-in breeding, with occasional mingling of foreign blood.

This idea was fully presented in an "Essay on scientific propagation" by John Humphrey Noyes, in 1870. Here the argument is fortified by a genealogy of Abraham and his descendants, showing the frequent mating of cousins, of brother and sister, of father and daughter, or of uncle and niece, in only half a dozen generations. Noyes also establishes that, to the breeder, uncle and niece are as much related as father and daughter, because brothers have identical blood; and also that "cousins, having each 50 per cent of the blood of brothers—*i. e.*, of the same blood—are in the same relation to each other as that of half-brothers." Since the stirpicultural experiment only produced one generation, this principle had but a limited application. In practice, nevertheless, such near relations as uncle and niece were twice paired; and it was further carried out in that a considerable proportion of the children have Noyes blood on one or both sides. The founder himself had eight children after he was fifty-eight years old, and among his adult relations in the community were his brother, his two sisters and their children, with his own son, born before the community began.

The second principle enunciated was that of careful selection of individuals for breeding purposes. Genealogies were studied and medical histories compiled. A committee, headed by Noyes, took charge of the matter, and selected the holiest members who were

free from physical defects. Intellectual and other considerations were given less weight, though in the later years physique and intellect were given their due place. The parents were of all ages, averaging as under ordinary circumstances, but the father was always older than the mother.

One essential consideration was quite noteworthy. This was the mutual attraction which must exist to at least a slight degree between persons mated. Again, it sometimes happened that a proposition would come from the individuals concerned, and if no objections were found such requests were granted.

The children born of this experiment between 1869 and 1879, inclusive, were sixty in number. Of these, five died at or near birth from unforeseen causes depending on the mother. The remaining fifty-five were brought up with the greatest care and under the best conditions until 1880, at which time they were from a few months to eleven years of age. The infants were cared for exclusively by their mothers until about nine months of age, and were nursed by them whenever possible; from then until eighteen months old the mother had charge at night only, while after that age her individual responsibility for the child ceased. The children's department, whither it was now transferred, was managed by those persons who had shown themselves best fitted for the work, and was in a house apart from the large community building.

In 1878 a "Report on the health of children in the Oneida Community" was published by Dr. Theodore R. Noyes, son of the founder. In this it was stated that serious sickness was unknown, and that the mortality at birth and to nine years was less than one-third that of the United States at large as given in the census of 1870. This difference is, however, partly due to the excellent sanitation, the protection from infection, and the other favorable post-natal conditions. The same may be said of the table comparing weight and height of these children with those of the Boston schools. Of nineteen of the former, then five to nine years old, all but one exceeded the Boston averages in height, and all but four in weight also. The weak member of this group was a boy who was deficient in coördinating power over his muscles, and was the one marked failure of the experiment. A noteworthy feature in the results was the excess of males, there being thirteen boys, but only six girls, within the ages mentioned. No explanation of this remarkable variation from the averages of New York State has been offered.

Doctor Noyes, in his "Report," draws the following conclusions: "First, a little common sense applied to the mating of men and women for propagation must largely increase the proportion of viable children born; second, a viable child, once past the perils due to its mother, is nearly sure to grow up free from checks to its growth under sanitary conditions as good as those now prevailing in the community." It is evident that pre-natal culture did not lesson the need of post-natal care, for the experimenters knew that the eyes of the world were upon them, and, moreover, they believed that the future of the community rested with them.

But alas! "The best-laid plans o' mice an' men, gang aft' aglee."

Stirpiculture was planned to insure the future of the church and the community: stirpiculture destroyed both.

Complex marriage, practiced by earnest, hard-working people, had held its own for twenty years. Selfish love—the loving of one person instead of the whole group—had been condemned and suppressed in every way, and so long as promiscuity was enforced the effort was successful.

But now one-fourth of the adult communists had been living in pairs for weeks or months, and these pairs had children; and there arose the unexpected issue—the Spirit of Monogamy—which now grew and spread until the whole body was infected with it. Success and leisure gave time for expressions of dissatisfaction; a discordant element found its way into the community; the old solidarity was gone, and each desired a mate.

Noyes himself was weighed down with advancing years and deafness, and seeing before him the failure of all his hopes he retired from the community.

It so happened that at this very juncture, in the summer of 1879, the clergymen of New York State became aware that an unusual, and from their point of view scandalous and immoral, social condition existed openly in their midst. They held meetings and appointed committees; but their crusade was prematurely cut short by the action of the communists. On August 26, 1879, the Oneida Community was assembled to consider a message from its founder, proposing that, "in deference to public sentiment," complex marriage should be renounced and ordinary marriage or celibacy substituted. A full vote was polled, and only three members opposed the proposition. This unanimity of opinion shows the state of feeling among the communists, to whom the threatened legislation against them was only the last in the series of events which led to the momentous

change. Those who had been married before entering the community, twenty-five couples in all, were again husband and wife, and twenty marriages between individuals not previously wedded took place within four months after the abandonment of the stirpicultural experiment. At this time two hundred and ninety-nine persons belonged to the community, comprising eighty-three children under twenty years and two hundred and sixteen adults.

The next step in this history followed quickly and easily after the returning wave of selfishness had swept community of person away. By common consent community of goods was abandoned, and the property and business were transferred to a joint-stock company, chartered November 20, 1880. Certain coöperative features are, however, retained by the seventy-five or one hundred persons who continue to live in the old community building. Before the annual dividends of the company are paid a sum is taken from the profits for the support of each of the products of the stirpicultural experiment until he reaches sixteen years of age. The company also supports a school for those who have not left the neighborhood.

Certain results of this experiment in human stirpiculture, probably the most systematic and extensive of modern times and civilized peoples, are displayed by the children born under its conditions. In weighing the results it should be remembered that the status of these children represents the product of two factors which cannot be separated: 1st, stirpiculture proper—*i. e.*, the selection of parents; and, 2d, community care and training of the young. This blending of causes was clearly recognized by Doctor Noyes. As he states it in the report above referred to: "The abolition of natural selection, by doing away with the vicissitudes which the strong alone can survive in childhood, must certainly lower the tone of adult health, unless artificial selection takes its place." In point of fact this artificial selection was so successful that the only death which has occurred among the children of stirpiculture since 1880 was that of a boy, reared in spite of weakness, who succumbed to a trifling malady at about sixteen years of age.

Speaking only of the older children, now twenty-two years old and under, the pride taken by the experimenters in their offspring is certainly warranted. The boys are tall—several over six feet,—broad-shouldered, and finely proportioned; the girls are robust and well built. The present occupations of the older youths are interesting in connection with the fact that, with the exception of the Noyes family and half a dozen lawyers, doctors, and clergymen, the

Oneida Community was composed of farmers and mechanics, and that the mothers generally belonged to the classes employed in manual labor. Of the oldest sixteen boys, ten are in business, chiefly employed as clerks, foremen, etc., in the manufactories of the joint-stock company. The eleventh is a musician of repute; another a medical student; one has passed through college and is studying law; one is a college senior, and one is entering college after winning state and local scholarships. This young man is considered by all as a student of remarkable ability and great mathematical promise. Finally, the sixteenth boy is a mechanic, the only one engaged in manual labor. Of the six girls between eighteen and twenty-two years, three are especially intellectual. One is at a female college, another is entering college with Greek as a specialty, and the last is a student of the kindergarten system. It is also interesting to observe that the fathers (including Noyes himself) were as a rule the intellectual superiors of their mates, and inquiry develops the fact, known in the community, that in these cases the children are markedly superior to the maternal stock.

As an index of the calibre of the offspring of stirpiculture it may be mentioned that favorite amusement is found in a debating society of three girls and four of the boys, which meets during the summer when all are at home.

It is a surprise to find that little interest is taken by these young people in the peculiar circumstances of their origin, and that in spite of their early doctrinal training only a very few are church members and but one is a Perfectionist. This one is the son of an uncle and niece, both of Noyes blood. Thus the main object of the experiment in stirpiculture, namely the perpetuation of the church through these children, is a complete failure.

This would seem to indicate that while our race would doubtless be greatly benefited by more attention to laws of breeding, yet to attempt promulgation of a belief by this means alone is only to court defeat. In spite of the energy and magnetism of so remarkable a man as Noyes, in spite of his long-continued efforts, and just when success seemed within his grasp, his one misjudgment of human nature bore fruit—the neglected instinct of monogamy arose in its might and crushed to nothing the whole structure; and he, the builder, went last of all. With the close of his life, April 13, 1886, ended a unique and instructive history.

A CHINESE IRRIGATING WHEEL.—A model of a very interesting irrigating wheel was recently sent to the U. S. National Museum from Kiung-chow, China, by Dr. Julius Neumann. The wheel is a light open construction having a broad tire, to the inner side of which are attached at intervals bamboo buckets slanting at an angle of 45° with the axis of the wheel. As the wheel turns in water the lower buckets are filled while the buckets in the opposite arc are discharging into a trough, the water having been raised to a height equal to the diameter of the wheel.

This simple, ingenious, and effective contrivance reflects great credit upon the inventive powers of the Chinese.

It is superior to the ancient tympanum, which was a wheel having curved tubes discharging through the axis, thus raising the water only a radius. The more modern tympana were supplied with paddles, and thus were moved by the current.

WALTER HOUGH.

The device described above was not at all uncommon in Nevada and California ten years ago, where it was probably introduced by Chinese immigrants.—EDITOR.

A FIRE-MAKING MACHINE.—A machine which combines the parts of the ordinary two-stick fire drill was seen in use some years ago among the people of the Nile, above the second cataract, by Dr. F. H. Hoadley.

The upright stick, bearing a cog-wheel on its upper end, was fixed in a frame and geared to a larger cog-wheel turned by a crank. By this simple device the labor and probability of failure in making fire were much decreased. The machine appears to have been an application of the irrigating devices in use along the Nile.

It seems strange that, considering the universal use of wood friction to procure fire, there have been so few improvements on the primitive tools. These improvements are comprised in two inventions, viz., the bow drill and the pump drill, which are not to be ranked as machines, but rather as machine tools.

WALTER HOUGH.

MOUNDS IN SOUTH DAKOTA.

BY DR. Z. T. DANIEL.

Pottery, stone implements, teeth, bones, shells, &c., are dug from the ruins of Indian houses along the western bank of the Missouri river, immediately in front of and a little north of Cheyenne river. There are a great many of these ruins or mounds, and they measure from 10 feet to 25 yards in diameter; they are round and are uninhabited, generally covered with grass like the prairie, and situated right at the bank of the river. There are none on the eastern bank. However, I am informed by Mr. Jeff Sage, a trader on the other side of the river, that these same circular mounds are on that side, also; if so, then the Rees occupied both sides of the river in their ascent. I got the impression somewhere that they confined themselves to the western hill.

The Sioux Indians here say that they are the houses built for defense by their old enemies, the Rees or Palani, and that they, the latter, made and occupied them during their war with the Sioux.

I am informed that they extend a great distance along the Missouri river, say from St. Louis, Mo., as far as Ft. Bexthold. Right here they are very numerous. The Sioux are the hereditary enemies of these Palani or Rees, and it is a fact, I believe, that the Sioux have driven them from one end of the Missouri to the other, upstream, and that as the Rees moved northward, always on the western bank of the river, they built these houses of mud and trees for occupation and defense.

The ruins consist of circular walls or mounds of earth of variable size, and were probably covered with trees or branches, having a center pole, and all covered with earth. Some are quite large and may have been designed for horses. They were mud houses. Their doors or openings always faced to the east or southeast, they being marked by a slight depression in the wall, and numerous remains of pottery, flint, chips, bones, teeth, &c., lying around, outside and inside; also are seen ash-heaps where a fire has been kept going a long time, and small bits of charcoal right at the doors. This is where they did their cooking—outside the houses.

I have not yet discovered an ash-heap within the walls, and as I understand the houses a fire would be impracticable in them.

All of the pottery is the work of the Arickarees or Rees, or, according to Sioux, Palani. I should judge that it was made, used, and broken more than one hundred years ago, or at a ime when the Rees and the Sioux were contesting in this country tfor the supremacy.

A CENTRAL AFRICAN'S DESCRIPTION OF A EUROPEAN WOMAN.—Magaga, one of the Wanyamwezi, saw an English lady at Zanzibar, and describes her thus: "I saw a white woman at Zanzibar; she had fastened a lot of cloth about her belly like a *Mrua* [a race of the Upper Congo], but she wore most of the pieces of cloth bundled together behind her, while the *Mrua* wears it in front. She had hidden her feet and hands in black and yellow bags, just as she overwhelmed her whole body with cloth. Her body was the ugliest thing about her—as thin round the belly as an insect; so that you would have been able to break it without much straining of your strength. She had tied her breast up high, so that she looked like a young maiden. But that was only a lie; she was an old woman—quite old; in spite of her lie, I saw that. Her face was very white. On her head she had a *Ngalla* (warrior's head-dress) of ostrich feathers, very high, of beautiful feathers. (This seemed to interest Maganga the most. He shook with laughter). She wore ear-rings like our women, and her step was like a man's. *I-icsch! Wasunga!* But I wouldn't like to have such an ugly wife, with a waist like an insect."—(Paul Reichard, "Die Wanjamwesi," *Zeitsch. Gesell. f. Erdkundi*, Berlin, vol. 24, pt. 4, 1889, p. 253.)

JOHN MURDOCH.

TAILED MEN OF NEW GUINEA.—A letter from the Dutch resident at Ternate was read at the meeting of the Berlin Anthropological Society on July 19, 1890, in which the writer states that when he was in Geelvink bay, New Guinea, on July 30, 1880, there came on board his steamer two natives with coccygeal bones projecting 4 cm. in length. As he was not an anthropologist himself, and had no surgeon on board, he was unable to make any detailed investigation. They were adult male Papuans, in good health and spirits, well shaped and muscular.—(Verhandlungen der Berliner Gesellschaft für Anthropologie, &c., 1890, p. 405.)

GAMES OF TETON DAKOTA CHILDREN.

BY J. OWEN DORSEY.

The material for the present paper was found in the collection of texts written in the Teton dialect of the Dakota language by George Bushotter, a full-blood Dakota. This collection is now in the possession of the Bureau of Ethnology, in Washington. The present writer is responsible for the arrangement of the information now given, besides its translation into English. Of those games in which children take part as well as their elders, there are five. Games played by none but children amount to fifty-seven, according to Bushotter.

Children of one sex seldom play with those of the other. Each game has its special season or seasons, and it is played at no other times of the year. Wherever Bushotter has named the season for a game, it will be mentioned in this paper.

None but girls can play Shkátapi chik'ála, *Playing with small things*, in which they imitate the actions of women, such as carrying dolls, women's work-bags, small tents, small tent-poles, wooden horses, etc., on their backs; they pitch tents, cook, nurse children, invite one another to feasts, etc.

GAMES PLAYED BY GIRLS OR BOYS.

One played in the spring is Wak'in'kichíchiyápi, *They make one another carry packs.* Some boys pretend to be horses and carry packs; packs are also carried by the girls. The children of each sex imitate their elders. When they pretend to dance the sun-dance, the boys cut holes in their shirts instead of their flesh, and through these holes are inserted the thongs which fasten them to the mock sun-pole.

Hóhotéla, *Swinging*, is an autumnal game. The swing is attached to a leaning tree after the leaves have fallen. When four ropes are used, a blanket is laid on them, and several children sit on the blanket and are pushed forward. Those who push say, "Hohote, hohote! Hohotela, hohotela!" as long as they push them. When two ropes are used, only one child at a time sits in the swing.

Chab ónaskiskíta, *Trampling on the beaver*, is played on pleasant evenings; therefore it is hardly a winter game. Each player gathers his blánket in a roll around his neck. The one who acts the beaver reclines with his blanket around him. The rest form a circle around him, and as they pass around they sing thus: "Chab onaskiskita! Chab onaskita!" Whenever there is a break in the singing, the beaver rises suddenly and chases the others, returning to his former place if he fail to catch any one. Each one caught joins the beaver in the middle of the ring, where they recline with their heads covered. Girls sometimes play this game. Not a game of chance.

Coasting is indulged in by boys and girls, but not by youths old enough to go courting. They use different kinds of sleds.

The seasons for the following games have not been ascertained:

1. Wi-ókichíchiyápi, *Courting the women.*—Played by boys and girls after sunset.

2. Hóshishípa.—Those who cannot keep from laughing are not desired in this game. Each player takes the back of the hand of the one next to him by pinching it, and thus there is formed a perpendicular pile of hands. The hands are swung back and forth while all repeat the word Hoshishipa. The first one who lets go is tickled till he laughs heartily. While each player holds the hand of his neighbor with a thumb and one finger, he uses the other fingers for scratching that hand till it gets red. As they swing their hands they lower them till they get near the ground.

3. Wónape kh'ákh'a.—When one sees that his comrades are dull he says, "My friends, I will wake you up." At once he throws an arrow, a stone, a handful of water, or some other thing into the air, making all scramble for it. Resorted to at times by the girls and young men.

4. *Ghost game.*—Played by boys and girls. One erects a lodge at a distance from the village, and at night he comes hooting like an owl and scratching on the exterior of the tent, where other children are seated. Sometimes the ghost whistles just as they imagine that ghosts do. Some ghosts whiten their faces and paint their bodies at random. Others put red paint around their eyes. All this is at night, when their mothers are absent. Occasionally the children leave the village in order to play this game, going in a crowd to the designated place. Some ghosts whiten their bodies all over, painting themselves black between the ribs. When they do not whiten the whole face they cover the head with white paper,

in which they punch eye-holes, around which they make black rings. The one acting the ghost tickles any one whom he catches until the latter laughs very heartily.

5. *Hide and seek.*—Those who hide whistle when they are ready. Each one who is found becomes the servant of the Wawole or Seeker, and has to walk behind him while he seeks for another. The servants walk in single file behind their master, in the order of their capture, till all have been found. Sometimes there are several seekers.

6. Iyópsīl echun'pi, *Jumping from a high object.*—The players go to a steep bank, below which there is plenty of sand. They jump down one after another, each trying to jump further than the others. If they cannot find a suitable bank, they look for a stump or a leaning tree. When night comes their limbs pain them, so some proceed as follows: Mixing ashes with water, they paint an ant on each shin-bone, which insures a speedy recovery. Other sufferers have their limbs rubbed with grease, and so they go to bed, without having the grease rubbed off. When their parents remove the grease the pain disappears.

7. Wakan' shkátapi, *Mystery game.*—In this they imitate the deeds of the *wakan* men and women. A small lodge is set up at a distance from the village, and in it is made a mystery feast, after which the *wakan* persons sing and give medicine to a sick person. Some pretend to be gods (tawáshichúpi); others claim to hear mysterious sounds; some have pebbles, which they say are gods or guardian spirits which aid them in various ways. Some pretend to conjure with cacti. Others give love medicines to boys who wish to gain the love of girls, or to girls who wish to administer them to boys.

8. *Playing doctor.*—This needs no explanation.

9. *Taking captives from one another.*—Played by many boys (or girls) at the middle of the village area. Two sides are formed. They approach, each party trying to capture their adversaries. The game continues till all of one side are captured. The captive must remain where his captors place him; he can take no further part in the game. Sometimes his garments are torn into rags, and he is subjected to other rough treatment. But all is done in sport, and no one gets angry. When a captive is released and ordered to go home, those on the other side, if boys, say, "Gliye! gliye! gliye;" but if they are girls, they say, "Glana! glana! glana!"

10. *String wrapped in and out among the fingers, etc.*—Played for amusement, not for stakes. Sometimes one ties a cord in a

strange manner, concealing the ends, which he requests some one else to discover. Occasionally he goes to a tree, bare of bark, or with smooth bark, and marks all over a part of it with many lines crossing at various angles, bidding the spectators find the ends of the lines. In winter one runs his finger along the surface of the snow, tracing a succession of turns hard to follow, concealing the ends for others to find. In summer this is done in the dust, or in the sand when they go swimming.

11. Shkâtapi tan'ka, *Playing with large objects*, differs from *Going to make a grass lodge* in this respect: In the latter none but boys take part, while in the former there are girls and boys, who imitate their elders in pitching tents, carrying packs, attending to the children, hunting, etc.

12. Okíchiyut'a$^{n'}$shni shkâtapi, *They do not touch one another.*—The players stand in a circle, and they ask who shall be the first one to sit down? He who sits down last becomes "it," and must chase the others without touching them. Those whom he chases blow their breath at him and spit at him, saying that his skin shall become callous. When he is weary he returns to his place and stands there; the others crowd around him and dare him to touch them. Bushotter says that when one has chased all the others, his place is taken by another, but the next is not very explicit.

13. *Old Woman and her Dog*, an evening game for boys or girls.—The children of the camp assemble and one acts the Old Woman, who says that she has a dog. The children come in a crowd to whip her dog. Each sits with his feet stretched out in front of him. The Old Woman approaches the one at the end of the row, saying, "Grandchild, what did you seek when you whipped my dog?" Then he tells why he did it, for should he or any other player fail to tell about his whipping the dog, the Old Woman must stand with both feet on his knees, pressing them hard against the ground. Thus does she punish those who whip the dog. She passes along the line of players and then retraces her steps, but this time she crawls over the knees of all the players till she reaches the first one. When she questions the children each must give a reason for his conduct. He may say, "I beat him because he tore my blanket." The Old Woman remarks, "You seem very fond of your blanket!" Another may reply, "I hit him because he made me lose my moccasins." If so, she kicks him on the feet. She always makes a ridiculous or an abusive comment on each reply to her questions.

14. Mató-kichiyápi, *Grizzly bear game.*—One child, who acts the bear, digs a hole in the ground and reclines therein. The others crowd around the bear, one being selected as leader on account of his bravery. The leader advances toward the bear, the followers stepping back a little now and then. The leader finally seizes a lock of the bear's hair, saying, "Tunkan'shila Mató, péhiⁿ waⁿ! *O, grandfather grizzly bear, here is a hair of your head!*" The bear springs up and chases the players as they flee in all directions. When he overtakes one he beats him or else he tickles him till he laughs heartily. The bear never chases the children until one repeats the words "Mato hiⁿ waⁿ." As soon as the captive stops laughing the bear desists from tickling him. The bear has some small sticks fastened to his fingers instead of claws. He goes to some plum trees and reclines beneath one of them. When the players go in a crowd to dislodge the fruit by shooting at it, the bear jumps up and chases them again.

BOYS' GAMES PLAYED IN THE SPRING.

1. Maká kichich'un'pi, *Use mud with one another.*—In the spring, when the ground is soft like putty, this game is played. Two sides are formed. Each boy presses a lump of mud around a stick, then, holding to one end of the stick, he hurls the other end forward, flinging the mud through the air toward one of the opposing players. The hole made by the end of the stick allows the air to pass rapidly through the lump of mud, which makes first a moaning sound like that of a nail thrown into the air; then another sound (tc-tc-tc-tc-tc), as if one blew through a tube. The players chase one another as they throw their mud balls.

2. Anàkichitan'pi, *Running toward one another.*—Played in the spring, when the leaves have opened and the small birds are singing in the forests, the meadow larks singing on the open prairie. The boys form two parties and play making war. They kill and scalp their opponents, using wooden knives. As they scalp they shout, "Aⁿ'he!" the cry of victory. Some are taken prisoners. Each one tells of his exploits. No one who is quick to take offense is allowed to join in the game.

3. Maká kichiⁿ'iⁿpi, *They hit one another with earth, i. e.*, with frozen earth.—This is regarded as a very dangerous game. It is played in the early spring. The boys form two parties, and then they chase one another, occasionally knocking down some one on

each side. Now and then the players stand on opposite sides of a cañon, armed with switches; the small end of each switch has a lump of frozen earth resembling the peculiar formation, ka^{n}ghítamè, found in the Bad Lands, pressed around it. He flings his stick forward and sends the lump of earth whizzing toward an opponent. Once upon a time when this game was played a brave youth advanced to the front in a boasting manner and hastened toward the other party, relying on the shelter of his blanket; but there came a frozen clod which struck the blanket and hit him squarely in the eye, felling him to the ground; so his comrades carried him home. Those on the other side yelled as they hit their mouths and started in pursuit of the others. Different ones have been blinded from playing this game; yet boys do not hesitate to engage in it, as it hardens them and tests their courage.

4. Tahúka changléshka un'pi, *Game with a raw-hide hoop.*—Occasionally in the early spring the people fear a freshet, so they leave the river bank and camp on the level prairie away from the river. The men hunt the deer, and when they return to camp the boys take part of the hides and cut them into narrow strips, which they soak in water; they make a hoop of ash wood, all over which they put the strips of raw hide, which they interweave in such a way as to leave a hole in the middle, which is called the "heart." The players form two sides of equal number, and ti-oshpaye or gens usually plays against gens. The hoop is thrown by one of the players toward those on the other side. They are provided with sharp-pointed sticks, each of which is forked at the small end. As the hoop rolls they throw at it, in order to thrust one of the sticks through the heart. When one hits the heart he keeps the hoop for his side, and he and his comrades chase their opponents, who flee with their blankets spread out behind them in order to deaden the force of any blow from a pursuer. When the pursuers overtake one of the fugitives they strike him with the hoop as hard as they can; then they abandon the pursuit and return to their former place, while the one hit with the hoop takes it and throws it, making it roll towards the players on the other side. As it rolls he says to them, "Ho, tatanka he gle, *Ho, there is a buffalo returning to you.*" When the stick does not fall out of the heart, they say that the hoop belongs to the player who threw the stick. This is not a game of chance but of skill, which has been played by large boys since the olden times. Bushotter says that it is obsolescent.

5. Maká shun'kawakan' shkátapi, *Sport with mud horses.*—In the spring boys get some mud from the bank of a stream and shape it into horses or some other quadrupeds. They play the game midway up the bank or in the forest. Sometimes they play before the images get dry. They make the images fight, and sometimes they make them dance. The players trade images or food. Now and then they make very good imitations of horses, which each owner keeps a long time. Sometimes they make buffalo. But whatever they do make, they use just as men use the real animals. When they make mud men they cause them to dance the sun-dance, and sometimes they make soldiers or policemen, whom they cause to engage in a fight. When they become tired of playing they destroy their images, unless they are good imitations of the originals.

6. *Flutes, etc.*—When the leaves appear in the spring the boys go to the woods and make what they call ya-pi'-za-pi, *something made to squeak by blowing with the mouth.* They make flutes of the wazí washtémna hu tan'ka (*the large stock of the sweet-smelling pine*), of small ash trees, of cedar, and of bone. Sometimes a boy doubles up a leaf and blows through it. This leaf is called Yapi-zapi hu, *bone which is made to squeak by blowing with the mouth.*

7. *Egg-hunting.*—Boys take their bows and arrows and go toward the interior of the country in search of birds' eggs. When the mother bird is on the nest she is sometimes shot, and there are occasions when all the eggs in a nest are broken. Sometimes they take all the eggs to the village. There the eggs are boiled, each boy eating those which he has brought home. When a boy hits a bird he makes a gash or notch with his knife on one end of his bow. Sometimes they boil the birds and eggs together in the same kettle.

8. Pezhí wokéya kakh ípi *Going to make a grass lodge.*—Bushotter and others played this game on one occasion when they were riding far from camp. It was in the spring, and the boys gathered tall rushes which they made their horses eat. Thrice each day they took their horses to water. They made a grass lodge in which all took seats. Two boiled food for a feast; the others danced, and after the feast they had a horse-race, putting up stakes for the winners. They engaged in other occupations, just as if they were men. They pretended to go on a war expedition, they hunted the buffalo and other animals, they danced the sun-dance, etc., etc. None but boys were present.

9. Tamníyokhpéye kághapi, *Ball of mud made to float is thrown at.*—In the spring the boys go to a deep stream, where they make two hemispheres of mud, each having one side concave, having been pressed against the elbow for that purpose. They join the hemispheres together, making a hollow ball about three inches in diameter. This ball is thrown into the stream as a mark at which they hurl lumps of mud. Sometimes instead of throwing the mud from the hand they press it around one end of a stick, and when the stick is jerked forward, off flies the mud toward the ball. When the ball is hit it is burst open with a loud report.

BOYS' GAMES PLAYED IN SUMMER.

1. Maghákichiyápi, *Goose and her children.*—This is very popular among the boys, but their mothers seek to break it up. However, the boys manage to slip off one by one and reach a stream where the game is to be played. While on the way to the stream they say one to another, "Let us see who shall be the first to reach there." One acts as the hunter, another as the goose, the rest being the ducks. They enter the water and swim about, slapping the water with the palms of their hands. By and by the hunter catches the boy who is goose, holding him by the hair of the head and saying, "Goose, how many children have you?" The goose gives the number, saying, "There are two," or "There are three." Whereupon the hunter pushes the goose's head under the water two or three times, or oftener, according to the number of children named in the goose's reply. Sometimes when the hunter is about to seize the goose the latter manages to escape to the shore, where the hunter cannot catch him. Sometimes the "ducks" dive; at other times they turn somersaults, alighting on the water in a bent attitude (*i. e.*, either with the body perpendicular and the limbs horizontal or *vice versa*).

2. *Throwing chewed leaves into the eyes.*—When the sun-dance is performed, the boys chew leaves and throw them into the eyes of the boys of another side, usually those of another ti-oshpaye or gens. Two sides are chosen by the players, gens playing against gens. They chew the leaves very fine and slippery. Some of the leaves are gray, others being green. They do not hurt any one by so doing, and no one is offended. Sometimes they moisten deer or buffalo sinew by chewing it, and hit one another across the face with the sinew.

3. *Hunting for young birds.*

AUTUMNAL GAMES OF THE BOYS.

1. Míchapécha un' kich'opi, *They wound one another with a grass which has a long sharp beard.*—When this grass is mature, the boys collect on the prairie and form two sides for the game. They chase one another, trying to stick their adversaries with the michapecha on the neck, ankle-bones, or on any other part of the body. The michapecha is arranged in bunches, with which the players hit at one another, not hesitating to give painful blows. The boys, for the most part, are stout-hearted, and they show no signs of flinching. They pretent to be engaged in real battles. This is no game of chance, its sole design being to promote the spirit of bravery among the boys of the tribe.

2. Changléshka kakhwóg'yapi, *Hoop that is made to roll by the wind.*—In the fall, when there are frequent breezes, the children play this game. They make a hoop, and when there is a wind they hold the hoop perpendicular for a short time and then let it go, the wind carrying it along. They chase it, going very far before they catch it. The hoop is made thus: A stick is bent with the hands and pack-straps are fastened to it, crossing one another at various angles. A piece of calico or of some other material is tied to the middle of the hoop. He who catches the hoop brings it back to the place whence it started. Not a game of chance.

3. I'pahotun'pi un'pi, *Pop-gun game.*—In the fall, when the wind blows down the leaves, the boys make pop-guns of ash wood. They load them with bark which they have chewed, or else with wild sage (*Artemisia*), and they shoot at one another. The one hit suffers much pain.

4. Chun'kshila wanhin'kpe un'pi, *Game with bows and small arrows.*—These arrows are made of green switches, before the leaves fall in the autumn. The end of each switch-arrow is charred to a point, and when it hits the bare skin it gives pain. The boys used to shoot these arrows at the dogs when they went for water.

5. *Throwing fire at one another.*—Played cool nights in autumn, as well as in winter. When the snow is deep the boys go to a sandy place and kindle a fire. Sides are chosen and a fight begins. Each player is armed with a firebrand. When they do not hit with the firebrands they hurl fire at one another. This is always played

at night. The next day many boys appear with burnt places on their bodies.

BOYS' WINTER GAMES.

1. Ptehéshte un'pi, *Buffalo horn game.*—The boys assemble at the corral, or some other place where the cattle have been slaughtered, and gather the horns which have been thrown away. They kindle a fire and scorch the horns, noticing how far each horn has been burnt. That part of the horn is cut off, as it is brittle, and they make the rest of the horn very smooth by rubbing. They cut off all the small and pliable branches and twigs of a plum tree and insert the root end into a hole in the horn, tightening it by driving in several small wedges around it. At the small end of the plum stock they fasten a feather by wrapping deer sinew round and round it. The pteheste is then thrown along the surface of the snow, or it often goes under the surface, disappearing and reappearing at short intervals. Sometimes they make it glide over the ice. Stakes are frequently put up by or for the players.

2. Chan káwachípi, *Spinning tops.*—Tops are made of ash, cedar, buffalo horn, red catlinite, or of stone. They put a scalp-lock on the upper surface, ornamenting the latter with several colors of paint. They make the top spin by twirling it with the fingers, or by whipping. When they make it spin steadily by whipping they redden the scalp-lock, and as it revolves very rapidly it seems to be driven into the ground. This game is played on the ice or snow; sometimes on ground which has been made firm and smooth by trampling. For a whip each player takes a tender switch, to the small end of which he fastens a lash of deer hide. He braids one-half of the lash, allowing the rest to hang loosely. They place the tops in a row, after putting up stakes, and say, "Let us see who can make his top spin the longest distance."

3. Itázipa kaslóhan iyéya echun'pi, *Making the bow glide by throwing.*—They do not use real bows, but some kind of wood made flat by cutting with an ax, with a horizontal curve at the lowest part, and sharpened on the other side. At the head a snake's head is usually made, or else the head of some other object. At the other end the player grasps it and hurls it, making it glide rapidly over the snow or grass. This is a game of chance, but the "bows" are never staked, as they are too expensive. It takes so long to make one that the owner does not sell it, preferring to keep it as long as possible.

GAMES PLAYED BY BOYS ALONE; NO SEASON SPECIFIED.

1. *Tumbling and somersaults;* Teton name, Tahu-shipa kichún'pi, *They play neck out of joint.*—Each player tries to stand the longest with his head down. Sometimes they turn backwards as well as forwards.

2. Tachághu yuhá shkátapi, *Game with buffalo lights.*—The boys used to assemble at the place where they killed the buffalo, and one of them would take a strip of green hide, to which the lights were attached, and drag the latter along the ground to serve as a mark for the rest. As he went along, the others shot at the lights. Sometimes the boy stood still, grasping a long withe fastened to the lights, which he swung round and around his head as he passed around the circle of players, who shot at the lights. Now and then, when a boy sought to recover his arrow, the other boy would strike him on the head with the lights, covering him with blood, after which he would release the player. Sometimes the boy holding the lights would break off all the arrows which were sticking therein, instead of allowing their owners to reclaim them.

3. Pezhí yuskīl'skīl kutépi, *They shoot at grass tied tightly in bunches.* Played by the larger boys. Grass is wrapped around a piece of bark till it assumes an oval shape, both ends of the grass being secured together. The grass ball thus made is thrown into the air, and all shoot at it, trying to hit it before it reaches the ground; when it is hit the arrow generally penetrates the object very far, leaving only a small part of the feather end visible. The one who sends his arrow near the heart or mark on the grass ball has the right to toss the ball up into the air; but he who hits the heart on the ball throws the ball on the ground, and then throws it where he pleases, when all shoot at it. This game is generally played till dark, but there are no stakes put up.

4. Howí! howí!—*Boys assemble and stand in a circle.* Each boy bends his fingers, connecting each hand with that of the next player on either side. Without breaking the ring, all the players skip to the right (a sort of dressing to the right), saying, "Howí! howí!" When they reach the appointed place they move around a circle, then they dress to the left, to the starting place, after which they move again in a circle. When they cease moving, one is placed within the ring, and he either stands or sits, according to circumstances. When the players stop dressing to the right or left they shout in unison, and the one in the ring hits the joined hands, one

after another, trying to escape from the ring. When the players have dressed to the right and left, and have gone around the circle several times, they stand in silence; then the one in the ring passes in and out beneath the arches formed by the joined hands of his companions. Now and then an arch is brought down with a thump on the back of the stooping boy. When the boy has gone through all the arches he resumes his place in the ring, the others dancing around him with hands unclasped. Again do they clasp hands and order him to try his best to break through the ring. Should he succeed, he runs in a zigzag course away from the camp. If any one of the players can grasp him as he breaks forth from the ring, the fugitive must carry that player away on his back, or the others will go to him and each will say, "I claim this marrow as my own." When the fugitive reaches "home," with the other boy on his back, the latter is called the chief, and is obliged to stand in the ring until he can carry off his successor in like manner.

5. Tókeshke un'pi, *How they are brought up.*—(Compare the English game of Follow my Leader.)—Children choose their leader. One says, "I will be next to him." Another agrees to be the third in order. The others select their places, and all go in single file, passing various obstacles. Now and then one misses his footing, from which time he takes no further part in the game. They continue moving till the last player falls. Then they begin the game anew, the last one to fall becoming leader. Sometimes they encounter a fallen tree, which they climb over; sometimes they have to cross deep gulleys; now and then they have to jump or turn somersaults, always doing what the leader does.

6. Unkchela kutépi, *Shooting at the cactus.*—This game is always played for amusement, never for gain. On the appointed day the boys assemble on the prairie. One, who must be a swift runner, takes a cactus root, into which he thrusts a stick to serve as a handle. Grasping the cactus by this handle, he holds it aloft as he runs, and the others shoot at it. During this game the swift runner himself is regarded as having become the cactus; so when one of the boys hits the cactus, they say that it enrages the boy-cactus, who thereupon chases the others. Whenever the boy-cactus overtakes a player he sticks his cactus into him, turns around, and returns to his former place. Again the cactus is held aloft and they shoot at it as before, and again the players are chased. The game is kept up till the players wish to stop it.

7. *Throwing stones at one another.*—In this game there are two parties of players, standing on opposite sides of a gulley. Each boy uses a sling made by fastening a piece of deerskin to a braided pack-strap. They do not hurt one another, nor is there any chasing.

8. Ichápsíl echun'pi, *Making the wood jump by hitting it* (Catty?)—When the boys play this game an imaginary stream is marked off on the ground, and the players stand on imaginary ice near the shore. They take turns at knocking at a piece of wood in order to send it up into the air. He who fails to send up the piece of wood loses his stakes, and he who succeeds wins the stakes. (Much of this text is not clear to the translator.)

9. Ogléche kutépi, *Shooting at an arrow set up.*—Some boys back their favorites among the players by furnishing them with articles to be put down as stakes. On each side of a hill there is an arrow stuck upright in the ground to serve as a mark. The players on one side shoot at the arrow set up on the other; the players at the front shoot at the arrow in the rear, and then the players in the rear shoot at the arrow set up at the front. The nearer a player sends his arrow to the mark, the more it counts. Sometimes one of the arrows set up is withdrawn temporarily from its place to be used for shooting at the other arrow. Only arrows are staked.

10. Tákhcha kichiyápi, *Deer game.*—When the boys play this game each player brings his deer bones, and some have ashes or pulverized earth in their closed hands. Some act as deer, the rest running around them. Those acting as deer use the deer bones, and they are chased and scattered by those having the ashes or pulverized earth. The ashes and earth are used for "shooting" at the deer, as well as for scattering on the ground. While they do not hit any one with the ashes or earth, they say that the clouds of dust which arise therefrom are smoke from guns. Some boys act as fawns, others as does. They play this game on a hillside. Sometimes a "deer" is said to be wounded, and then the players pretend to flay the animal and to carry the hide to their homes; but the "hide" of the "deer" is a blanket.

11. *They kick at one another.*—Not a game of chance. An equal number of players are chosen for each side after the boys assemble in the middle of the camp circle. When some say "Chu!" the others reply, "Come, let us play kicking at one another." So they rush at one another and kick in every case with great force. They do not grasp their opponents at first, but when any player runs

towards "home" and is overtaken by his pursuers, he is pulled to the ground and with their knees they make his nose bleed, or else they kick him around. This game is resorted to as a test of bravery. He who cries out from pain is deemed fit only for the society of girls.

12. Kichíkshanpi, *Wrestling.*—In this sport they never trip each other, but each seizes his opponent around the waist in trying to throw him down.

13. Owan'ka kichích'ipi, *Snatching places from one another.* (Pussy wants a corner?)—Played by boys in the evening. Stand in the ring, one in the middle. Those in the ring change places constantly, and the one in the middle tries to get the place of some one of them. When he succeeds, the person displaced must stand within the ring until he can displace some one else. Each player rolls up his blanket and stands on it as his owanka or place.

14. Tuwá tokeya yái-la shníka? *Who shall get there first?*—When boys are going somewhere one says suddenly, "Let us see who shall be the first one to reach yonder bush. The last one who gets there shall be compelled to play with girls and wear girls' clothing;" or he may say, "The last one who gets there shall have a son with very large nostrils." As the threatened result is considered very undesirable by the Indians, each boy runs as fast as he can. The unfortunate boy who gets there last is shouted at and derided until he gets angry and gives them bad names.

15. Hóshnanshnan kichun'pi, *Hopping.*—The boys set up an object as a mark or starting place. One of the boys stands there and hops as if he were lame, going as far from the starting point as possible, and returning thither in the same manner. Each succeeding player tries to hop further than his predecessor. When he desires, he can hop on the other foot. This exercise makes them very weary, but it strengthens their limbs. Sometimes they draw a line on the ground with their toes to mark the distance hopped by one of the less fortunate boys. No one can hold his foot with his hand as he hops.

16. Wíkinĭl-wichákiyápi, *Causing them to scramble for gifts.*—When a boy has plenty of property, such as paslohanpi, arrows, tops, or many small things of different kinds, he invites his companions to a feast, and throws up one thing after another into the air. Whoever catches an object as it falls becomes its owner.

17. Can-shŭng'-akan'-yankápi, *Sitting on wooden horses*—They take sticks of green wood, tie cords to them to serve as bridles, and sit astride the sticks; use a switch for a whip; imitate the gaits of

horses. Sometimes two forked sticks are driven upright into the ground, and in the forks of these sticks another stick is laid horizontally, on which is placed a saddle, on which a boy sits. Sometimes a saddle is placed on a fallen tree and a boy rides thus. Occasionally a boy, who acts the horse, holds two sticks for front legs, going on all fours, and another boy mounts him and rides around.

18. Hohú yukhmun'pi, *Making the bone hum by twisting the cord.*—Bone is not the only material used, for the toy is sometimes made of stone or of a circular piece of wood. This toy is made thus: Some deer or buffalo sinews are twisted together, parts of a deer's foot are cooked till soft and strung together on the sinew. To the ends of the sinew are fastened two sticks which serve as handles, one stick at each end, each being at right angles to the sinew. The sinew is twisted, and when pulled taut the toy makes a humming sound.

Another variety is called Chan' kaóbletuntun'pi, *Wood having edges*, not circular, but made thus: A straight piece of wood is prepared with four sides or edges, and is fastened by a strip of hide to another piece of wood which is used as a handle. The boy grasps the handle, whirls it around his head, making the four-cornered piece move rapidly with a whizzing noise. This may be compared with the "bull roarer" of the Australians.

The third variety is made of stones shaped like the bones in a deer's foot. These stones overlap as do the real bones, and when the leather cord is twisted the bones make a peculiar sound, as if a the boys and girls.

19. *Pretending to die.*—When boys imitate the acts of those who wear grass around the waist (the Pezhi mignaka kaghapi), he who intends to feign death sits and acts as if he were a man, bowing his head while the others sing one of the songs peculiar to the game; but when they beat the drum, he rises to his feet and goes to the middle of the circle. He dances in a crouching attitude. Finally he slips and falls, kicking while he lies there. One of his friends dances toward him and tries to raise him; but as the fallen boy seems to be dead, his friend dances back to his former place, dragging the body.

GAME PLAYED BY BOYS AND YOUNG MEN.

In the winter the boys collect the good ribs of animals that are near the village. They make gashes across them, and on one side

of each rib they make a hole, in which they insert two plum sticks. The small end of each plum stick they insert into the hole of a quill feather of some bird. The small end of each plum stick is bent backwards. Just at the fork of the two plum sticks the player grasps the toy, called "hutanachute," making it glide over the snow or ice. Stakes are put down when desired, but sometimes they play just for amusement. Occasionally young men join the boys in this game.

GAME PLAYED BY CHILDREN OR ADULTS OF EITHER SEX.

Chŭn wíyushnan'pi, *Odd or even.*—Played at any time by two persons. A like number of green switches must be prepared by each player. Sumac sticks are generally chosen, as they are not easily broken by handling; hence one name for sumac stalks is "Counting-stick stalks." One stick is made the odd one, probably distinguished by some mark. When they begin, one of the players seizes all the sticks and mixes them as well as he can. Closing his eyes, he divides them into two piles, taking about an equal number in each hand. Then, crossing his hands, he says to the other player, "Come, take whichever lot you choose." Both players are seated. The other player makes his choice, and then each one examines what he has. He who has the odd stick wins the game.

AUTUMNAL GAME OF THE BOYS OR WOMEN.

Paslóhanpi, *They shove it along.*—The boys play this game when the leaves become a rusty yellow. They go to a place where the smallest kind of willow abounds, and there they make a fire. They cut down the straightest of the willows, shaving off the bark with knives. Some color the willows in stripes. Others change the willows into what they call "Chan kablaskapi," *i. e.*, wood flattened by beating; but what these are Bushotter does not explain. Much of this text is very obscure. Sometimes the young women play the game, at othertimes the men do; but each sex has its peculiar way of making the paslohanpi glide along. Sometimes they play for stakes.

GAME PLAYED BY BOYS, YOUNGER MARRIED MEN, OR WOMEN.

Ta-síha un'pi, *Game with the hoofs of a deer.*—They string several deer hoofs together and throw them suddenly upward. They jerk them back again by the cord to which they are attached, and as they fall the player who has a sharp-pointed stick tries to thrust

it through the holes of the hoofs, and if he succeed he counts the number of hoofs through which his stick has gone. A number of small beads of various colors are strung together and fastened to the smallest hoof at the end of the string. When a player adds a bead to those on the string he has another chance to try his skill in piercing the hoofs. When one misses the mark he hands the hoofs, etc., to the next player. Each one tries to send the stick through more hoofs than did his predecessor. Two sides are chosen by the players. Each player offers articles as stakes for the winner. The season for playing is not specified.

The women, when they play this game, bring their husbands' goods without the knowledge of the owners, and sometimes lose all of them. When the men play, they sometimes stake all of their wives' property, and occasionally they lose all. Now and then this game is played just for amusement, without having any stakes.

LAGUNA INDIAN VILLAGES, NEW MEXICO.—The following information, furnished through the kindness of Maj. George H. Pradt, who for a number of years has been a resident of the pueblo of Laguna, New Mexico, will prove of interest. Laguna is the youngest of all the pueblos, having been established, according to Mr. Bandelier, by a band of Zuñis and Queres in 1699. Major Pradt states that the eight villages which prior to 1870-71 were occupied during the summer season only, now form permanent residences of many of the families, although a few of the Indians "still keep up their houses in Laguna and sometimes. occupy them a few weeks."

It would thus seem that the pueblo of Laguna proper will, ere many years, be numbered among the countless ruins of the Southwest. As is exemplified by Spanish history of the pueblo region, the village tribes do not adapt themselves readily to advanced civilization. The Atlantic and Pacific railroad, which passes through a portion of town, is doubtless instrumental to a greater or lesser deeree in effecting the gradual depopulation of Laguna. The national censuses of the last three decades indicate a steady decrease in the population of all the pueblos. The number of inhabitants of Pojoaque, for instance, according to the estimate of Whipple in in 1856, was 500, a somewhat exaggerated figure, no doubt, yet sufficiently correct when compared with the present population of less than twenty souls to illustrate what rapid changes are taking place.

One or two of the former inhabitants of the celebrated pueblo of Pecos, the largest of all the Indian villages in the territory now embraced by Arizona and New Mexico at the time of Coronado's march, are perhaps still alive at Jemez; more likely, however, they too are now numbered among the dead. At the present rate of decrease, it would not be unsafe to say that before the close of another half-century a number of the pueblo tribes will be totally extinct. It remains to be seen if the rate of decrease will not be checked.

The native names with their English significations, and the terms, commonly applied to the Laguna villages, together with the distance of each from the so-called main pueblo, as furnished by Major Pradt, are as follows:

Hasatch ("a place to the east"), common name Mesita Negra, three miles east.

Queesché (a phrase meaning "take it down," and referable to some ancient tradition), common name Paguate, eight miles north.

Pun-ye-kia ("house to the west"), common name Encinal, six miles northwest.

See-mun-ah (so named from a black hill near by), common name Paraje, six miles west-northwest.

Pun-yeest-ye ("a place to the west on the bank of a stream"), common name Santa Ana, three miles west.

Pu-sit-yit-cho ("edge of hill on the west"), common name Casa Blanca, four and one-half miles west.

Wa-pu-chu-se-amma ("a little doorway leading west"), common name Puertecito, six miles west.

Zi-amma ("place of the Sia people"), ten miles west. So named because, it is said, some people of the Sia pueblo once lived there.

"There is a ruin on the mesa west of Rito called Shuma Sitcha ('the corpse on the summit'), which was occupied by the Lagunas at the time of their wars with the Navajos and Apaches. It was used as a place to guard the herds when there was danger of a raid. The name is derived from the fact that at one time the corpse of a herder, who had been killed by a wild animal, was found on the highest point of the hill.

"Of these outlying villages Queesché or Paguate is the oldest and largest, containing about 350 to 400 people. Moquino is now a Mexican village not on the Laguna grant."

Major Pradt states that the native name of Laguna is Ka-waik, an old Acoma word, the meaning of which he was unable to trace.

F. Webb Hodge.

SOCIAL ORGANIZATION OF THE CHINESE IN AMERICA.

BY STEWART CULIN.

An interesting fact connected with Chinese immigration is the systematic way in which it has proceeded, whatever has been its direction. Its pioneers have always noted the opportunities for their countrymen, and been followed by others, when circumstances were favorable, until the demand for their labor was supplied. A Chinaman, too, never abandons a profitable location without making arrangements for one of his relatives or friends to succeed him, and it is a matter of constant inquiry among the Chinese in the United States to find a new place where they or their fellows can better their fortunes. They are eager to learn of England; they discuss the possibilities of Mexico and South America, while the population of every American city is known to them, and even the smallest towns are canvassed in the hope of discovering another foothold for one of their people. It may be said that the distribution of the Chinese in the United States is less influenced by mere chance or the agency of exterior forces than that of any other class of emigrants. Intelligent coöperation and self-direction have been the means of accomplishing what popular opinion, in default of better reason, attributes to slavish allegiance to the "Six Companies" of San Francisco.

I have frequently been urged to go to China, or at least visit the Pacific coast, to study the Chinese; but, while the field of my observation has been confined entirely to the cities of this seaboard, I have felt no lack of material and often profited by the conditions that are regarded as unfavorable. I have seen the founding and development of several Chinese colonies, and watched their growth from a handful of timid laundrymen into organized communities of several thousand souls. It is of their beginnings, organization, and development that I desire to speak in the present paper.

The Chinese laborers in the United States all come from the immediate vicinity of the city of Canton. They describe themselves as the "people of the soil," as opposed to the Hakkás or foreigners, emigrants from Fuhkien province, who settled in Kwantung some centuries ago. They all speak the Canton dialect, but have a number

of local patois, according to their village or district. They divide themselves into the people of the Sám Yup, "Three Towns," and the people of the Sz' Yup, "Four Towns," after an old tradition that conveys more than matter of geographical relation. There is a hostile feeling between the Sám Yup and Sz' Yup people.

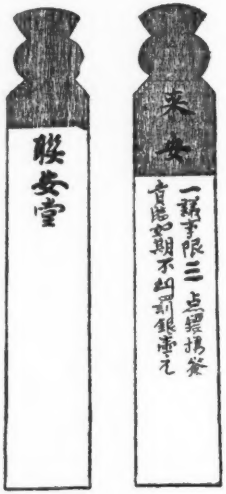
They belong to a number of clans or families, which are indicated by their surnames. Three or four of these preponderate and outnumber all the others, as in China, where three-fourths of the entire population belong to three or four of the several hundred families. There are few people from Canton, Hong Kong, or, in fact, any of the cities, among them. They are almost without exception peasants, tillers of the soil, villagers who lived as their ancestors had done—governed by their village elders, subject to the head of their family—and so remote from foreign influences that even clocks and watches were almost unknown, and their village watchmen burned incense through the night to tell the hour.

It is now more than ten years ago since I made my first acquaintance with the Chinese laborer. He was a laundryman, one of the pioneers, the first indeed to establish himself in the city of Philadelphia. His name was Lee Fong, familiarly Ah Lee—an angular hollow-cheeked man, whose picture as he appeared in his better clothes is more like the portrait of a corpse than that of a human being. Through his kindly influence (for in spite of his dolorous appearance and equally doleful speech and manners he was a very kind-hearted man) I made my first studies in Chinese ways. Other Chinese laundrymen had established themselves in the city, and I had already visited his "cousin," a laundryman who supplied his countrymen with opium and Chinese tea and incense, when one day he told me that a restaurant was to be established. It was the first step towards the consolidation of the little colony. The following Sunday the restaurant was opened on the floor over the laundry, where the vender of tea and incense divided his time between his scales and his flat-iron. This place soon became the acknowledged center of the Chinese in Philadelphia. On Sundays and Mondays it would be packed with Chinamen, and the strains of the Chinese fiddle could be heard over the never-ending click of the dominoes, from midday to midnight. It was here the feud arose. It was here the memorable meeting of the Moy family was held. Here indeed the colony began its history. I cannot quite recall when my doleful friend told me the Lees were

to have a shop. The Lees had abandoned their former meeting place and left the Moys in possession since the quarrel, and now they were to have a shop of their own. Lee Tong had been brought from New York city as "manager," and many of the Lees had taken shares. I can well recall the delight I had in the little store. A week scarcely passed before I made an inventory of its stock, from the fossil-crabs, used as medicine for sore eyes, to the dried prawns and salted olives in the great earthen crocks by the wall. The mild-featured shop-keeper would put on his great rimmed glasses and pore over a book, while I, a privileged person, would recline on the mat behind the peep-hole, in the little apartment back of the shop, and watch all that happened. The shop-keeper was the factotum of the colony. He acted as its banker and its letter-writer. It was he that drew up money-orders and copied in a round hand the English addresses on outgoing letters. He was the postmaster, too, and like some of his official brethren in the rural districts, would let every one help himself. Moreover, he was the apothecary, and compounded the long Chinese medical prescriptions that were brought to him with alarming frequency, with scrupulous care. He himself had written the prescriptions, as I afterwards learned. Besides, he maintained the dignity of the colony, especially in it relations with the outside world. Even the policeman was respectful in addressing him, and he was always spoken of by Americans as Mr. Expansive Harmony, from the name of the shop, of which he was regarded as the wealthy proprietor. Yet my new friend was only an employé of the coöperative store, receiving a salary of thirty dollars per month, the wages of a common laundryman—the uniform wages, in fact, of the Chinese laborers on the eastern coast. As years went on he grew tired of his long expatriation and went home to China, and others in turn succeeded him—all just as kind, sensible, and polite as he had been.

It was not long before I discovered that my intimacy brought its responsibilities. While I was invited to the feast on the last night of the year, when the family came together to solemnly worship before the shrine of the Three Starry Sages, and became so closely identified with the family that I knew its innermost secrets, I also became identified with its feud. What mattered it now that I had found out about the little squares of stamped paper that fluttered down daily from the loft above shop, and daily made a stir in the little com-

munity, or could read the inviting labels on the gambling-houses along the street? The shop was not alone now. Red-paper labels fluttered on all the houses nearly, and the "street" had undergone a transformation from the real common-place residences into one of mysterious mansions, which were spoken of in the newspapers as "dens." It may be unwise to tell that gambling was its chief enterprise and the sentinels in every doorway pointed to a state of siege that verily existed, for foreign laws and internal strife made vigilance the price of existence. The feud grew apace. At first the



Lees received so many additions to their number that they became strong and fearless, and then I first heard of the I' Hing. The name was never spoken above a whisper. I was cautioned never to talk of it. The armory of the shop was replenished. Men would go home at night in companies. Life in the colony became burdensome. The I' Hing, the "Patriotic Rising," the Triad Society of unhappy memory, had been established in Philadelphia and recruited among the Moy family, and the ignorant Sám Yup people had united all the enemies and rivals of the Lees in combination against them. The story of the feud will never be known

to the outer world, if, indeed, the world cared to hear it. Its true origin is lost in remote antiquity. From time to time a truce would be declared. Valuable financial interests were at stake. The merchants, the chief sufferers, formed a guild. The accompanying figure represent two of their notices of a meeting. They are wooden tablets 8½ inches in length, inscribed on one side with the name of the "Hall," as such organizations are designated, and on the other the names of the particular shops to which they were directed. Below is written the hour of the meeting, with a statement that a penalty of one dollar will be imposed for non-attendance. These tablets, one for each member, were kept by a person designated for the purpose, and any member of the guild who had a grievance would repair to him and direct him to call a meeting. The custodian, being duly paid the sum of one dollar or more to pay for tobacco at the meeting, would inscribe on the *Chim i sz'*, as the tablets are called, the hour of the assembly, &c., as here appears, and carry them to different shops. The tablets formed the credentials of their representatives, who laid them upon a table upon entering the room. Such assemblies are for the express purpose of "arranging affairs." Both sides tell their story, and the others endeavor to bring about a settlement. The meetings are not of a judicial character. The methods employed are based entirely upon Chinese custom, no consideration being given to the foreign law, concerning which the Chinese are equally ignorant and indifferent. When a laundry or shop is sold, the seller must place a notice on the doorway, stating that a change has taken place in the ownership, and that the payment of the money will take place at such a time on a given day. This is done that creditors may claim their dues, and the buyer must take care that the custom is complied with, as otherwise he is held responsible for the unpaid debts of the former owner. This may serve as an illustration of the Chinese mercantile usages, which are strongly enforced by public sentiment in the Chinese communities.

I have dwelt at some length in a former paper on the exhibitions of the religious sentiment among the Chinese in our eastern cities. A death seems to develop it, and the ghost becomes the object of daily propitiation. The deified hereoes of the native pantheon are worshiped here, but the ghosts command the stronger emotions of fear and sympathy.

XUM

Turning from the colony in Philadelphia to the larger and more highly organized community in New York city, it may be interesting to note the occupations of its inhabitants and their various guilds, clubs, and trades unions. Coöperation, it will be observed, its conspicuous everywhere. They buy their wares at a coöperative shop; they eat at a coöperative restaurant; they borrow money from coöperative, socities and when they die a coöperative society carries their bones back to China and buries them. First in point of numbers in New York city are the laundrymen. They have a union that fixes prices uniformly and arranges disputes, with an agent who constantly travels over the city and endeavors to maintain harmony.

Next in number to the laundrymen come the cigar-makers, all of whom arrive here by the way of Cuba, and usually speak a little Spanish. They too have their trade union.

After the cigar-makers come the gambling-house keepers, with their society, a more or less secret organization.

Then the merchants, who have a guild entitled the "Chinese Public Hall." The custodian of this hall is elected annually and acts as peacemaker in the community.

These comprise all the trade orgaizations, though far from including all the trades and occupations that are centered in the Chinese colony in Mott street. Cooks, barbers, tailors, fortune-tellers, carpenters, painters, not to speak of physicians and venders of fruit, swell the number. Two-thirds of the inhabitants are enrolled in the I'Hing, the revolutionary secret society. Three of the families or clans have an association for mutual protection, and this guild, the secret society, and the merchants each have a hall more or less handsomely decorated and containing a shrine of the god of war. Coöperation is seen to extend even to religious observances, for the shrine serves chiefly as a convenience for fortune-telling, to the members of the guild. To summarize the elements of social organization among the Chinese of whom I have spoken, we find: First, the *clan* and the *village*, representing family and early association; the *secret society* or political combination, and the *trade guild* or mercantile coöperation. Corresponding with these are the laundry, the shop and the gambling-house, which may be associated with the clan and the village, and the guild hall, with the political and mercantile combinations.

ON ZEMES FROM CATAMARCA, ARGENTINE REPUBLIC.

BY SAMUEL A. LAFONE QUEVEDO.

Mr. Fewkes' paper on Zemes in the April number of the AMERICAN ANTHROPOLOGIST has suggested the following notes:

In 1886 I obtained a small object in white stone, Fig. 1, which I at once suspected to be some form of *Guacanquillo* or amulet. I had already secured some three or four specimens like that in Fig. 2, which are called *Guacanquillu* by the learned in such lore.

The word *guacanquillo* is but a diminutive of the Quichua *huacanki*, certain herbs or stones which are said by the Indians to be love-charms (Voc. by von Tschudi). The word *huaca* itself is used to designate stones of many colors, or indeed anything rare or strange.

How far these charms were produced by those who used them is a question not so easily solved. I rather incline to the belief that they were the work of pre-Columbian races, discovered in pots and graves of the older tribes and looked upon as lucky stones by those who found them.

Medina in his "Aborigines de Chile" illustrates one of these emblems (Figure 99). He ascribes it to the Chango Indians, and says they probably used it in making their nets, Fig 3.

One thing is quite evident, that the end nicks seem to be correlated with those on Fig. 1, and its shape to reproduce Fig. 2.

The most natural hypothesis is that they are all three *zemes*, and of very considerable antiquity; probably the work of those nations which were overthrown by the barbarous hordes spoken of by Montesinos. They seem to have begun their incursions about 500 years before our era, and to have continued them for more or less 1,000 years.

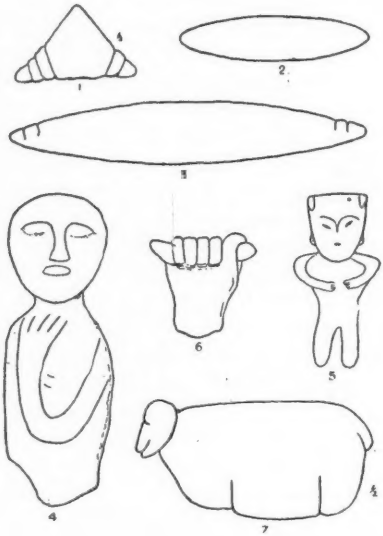
If we compare these tracings with the cuts in Mr. Fewkes' paper, we cannot help being struck with the resemblance. Moreover, my linguistic investigations lead me to the belief that the Caribbee element is very strong in all the chief South American nations.

Wooden *huacas* or *zemes* are very scarce in our region, and for obvious reasons: the wood of the *algarrobo* tree, the *tacu* of the natives and *Prosopis dulcis* of botanists, soon decays. A dry rot

sets in which destroys all this wood when once submitted to the action of the soil. I have, however, secured one specimen, which was found in a very beautiful coffin-jar near Santa Maria, in the Calchaqui region.

This little *zeme* is given in natural size, and is carved in low relief, but not badly. Fig. 4.

Idols in clay are very numerous, but I should be exceeding the bounds of this paper were I to give an account of this part of my collection. Fig. 5 represents one of these little idols 16 cent. high. The color is pinkish. The ears are pierced, probably to carry little pins.



When we remember how the missionaries secured and destroyed all these superstitious symbols, it is surprising that so many have survived.

But stranger than all is the little hand-zeme, Fig. 6, one of many found in this region. A very curious incident is connected with this specimen which I shall proceed to relate:

It was found in Pilciao, near Andalgola, as far back as 1861, and given to me then. At that time a Frenchman from Mazatlan asked

me for and obtained employment in our works. One day, as he was showing me some Mexican curiosities, out came a little hand carved in white stone, the very counterpart of mine. I at once proceeded to claim it, and it ended in our making a wager which I lost; for, on going to the drawer in which I kept such treasures, there I found my little hand safe enough.

I have possessed two or more similar specimens, and there are others in the La Plata Museum, all from this region. It would be well worth while to inquire whether my Frenchman's was the only specimen known in the north.

Seeing that the prey-gods of the Zuñis are so often to be met with here, why should we be surprised to find *zemes* as well.

Fig. 7 is a drawing of one of these prey-gods in a sort of jade or soapstone. It was found near Pomair.

To say it is something like a sheep would imply that it belonged to the time of the Spanish dominion; but as it happens, I have another like a camel, and where could this come from? They must be the work of men who brought them from the land where sheep, camels, etc., were. They must have been buried, lost and again found to serve as *zemes* or charms.

Unfortunately the earliest volume which I possess of the Smithsonian Institution's publications only goes as far back as 1879, therefore I cannot compare mine with Mr. Mason's drawings, but I think I have said enough to attract the attention of Mr. Fewkes and other students in this branch to the importance of Catamarca as a field for investigation. Zemes, huacas, prey-gods, charms, etc., are frequently to be met with, and must have much to tell us of the old people who once inhabited both halves of our continent.

A TRAVELER'S NOTES IN THE CALCHAQUI REGION, ARGENTINE REPUBLIC.

BY S. H. L. QUEVEDO.

I.

How is it that anthropology, archæology, and history have hitherto done so little toward clearing up the mystery of the Kakkan race and language? The answer is simple enough: it is because no one has made a beginning.

So far we only have the usual curiosity-monger's collection, which fills a considerable space in public and private museums. They have been brought together without any regard to their history and accurate arrangement. An object, a skull, is said to be from Catamarca, without a hint that it matters very much from what district of this province, and from what particular archæological stratum it comes. In fact, we are yet in the infancy of Argentine research.

Two years ago Dr. F. P. Moreno, director of the La Plata Museum, sent an exploring expedition to search and excavate up and down the Catamarcan area. The services of a very clever draughtsman and photographer were secured; consequently the first methodical attempt has at last been started to obtain reliable information on the racial and art antiquities of the Kakkan region of the Argentine Republic. We must wait for the full report of this expedition, which would have been out already but for the unfortunate revolution and money crisis in Buenos Ayres.

So far the following facts are notorious: First, that in this country we have mounds called Allpataucas ("earth-heaps"), which at one time were common enough in the Londres and Catamarca valleys. Second, that adults were buried in big jars, stone-lined or stone-covered graves, or caves, and in various ways in the ground. Third, that children were potted in very beautiful vases, well stopped up with bowl-shaped lids, and otherwise secured from corruption.

It is also reported from the Chiriquano hunting grounds that these Indians bury their dead infants in jars, which are consigned to the earth in regular cemeteries, whereas adults are potted and buried

in their dwellings, while their widows have to keep watch and guard over the remains for a whole year.

Before the patient dies he is held up in a sitting posture ready for potting, more or less as in the vignette, Fig. 1, figured in the Vicomte de Porto Seguro's book on the Tupi-Caribes, "L'Origine Touranienne, &c." This custom may account for another, still to be found in the Andalgalá district of Catamarca. When a patient is on the point of death they rush out for some man to hold the dying person in his arms.

FIG. 1.

Let us now turn to a very unpretending, but useful little book, "Las Misiones Franciscanas" by Cardús. He tells us of the Bolivian and Argentine Chaco Indians, and has much to say of the Chiriquanos and Tobas.

The Chiriquanos are the Guaraní-speaking Indians of the eastern slope of the Bolivian Andes; the Tobas, veritable Chaco *Huris* or *Suris*, for the very Matacos, their neighbors, call them *Huanhloi*, "ostriches."

In Cardús we see how the Chiriquano maidens on reaching womanhood have their hair cut, fast, and are kept strictly secluded during several months (p. 246).

When a Chiriquano man dies they dress him up in his best, paint his face with *urucú* (a red color), place him sitting within a big jar, with what is needful to strike a light, a guard with *chircha* "maize beer," and perhaps a parrot, and so well bedizened and provided, all in a sitting posture, they cap him with the lid, itself the half of another jar, and bury him within the hut; and then the howlings begin at midday, sunset, midnight, and dawn (p. 247).

In the Calchaquí region we find bodies buried so in big jars covered in with other pots. In Huasan, near Andalgalá, a whole row of these jars was tumbled into, in ploughing, but the jars and contents were broken up and dispersed before they could be utilized. On the other hand, pots with children's bones abound everywhere, and are usually most elaborately painted.

It would seem, then, as if in Calchaquí, there once lived a race which resembled the Guaranian Chiriquanos in their burial customs; but the language was not the same, for the missionary, Father Barcena or Barzana, is expressly mentioned as having learned and written both Kakkan and Guaraní.

Here occurs a curious question: Did Chiriquanos forget their

own tongue and learn Guaraní in their actual abode, or did Chiriquano-Guaranis enter the Calchaquí valleys and learn the local Kakkan? So far as we can now find out, the Chaco at the time of the conquest was occupied by races speaking Guaraní, Abipon, and Vilela, or so-called Lule dialects, belonging respectively to my B, A B, and A groups. Along with these we find Quichua (A class), Mataco (B class), and a few other dialects more or less allied to these.

History tells us that the Chiriquanos in their day were the scourge of all surrounding nations. Guaraní-speaking tribes must be looked

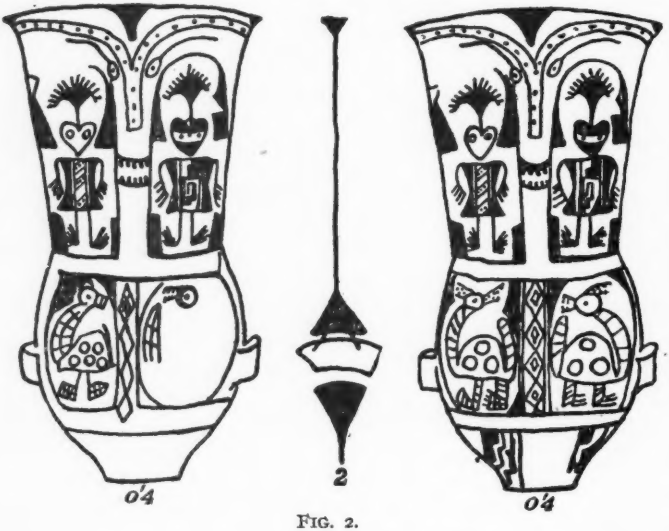


FIG. 2.

upon as allied to the Chaco Indians of the Abipon type. The latter are the real proprietors of these difficult, guttural languages, so often referred to by the Jesuit Fathers. We may therefore safely admit that tribes more or less Guaranian, more or less Abiponian, from time to time and in successive waves, entered the Calchaquí valleys and mountains and evolved the Kakkan tongue—not exactly Quichuan, but not altogether distinct.

Such an hypothesis as this would easily account for the utter loss of a cognate dialect in presence of the court language of the same

family. The fact remains that Spanish utterly destroyed Kakkan, but preserved Quichua, which even now is far from dead. Lozano says the Calchaquí Indians moved about and built wattle-huts for themselves. So far they resembled their Chaco neighbors. On the other hand, they did sow and reap, and so far were more civilized. This would seem to imply that a more barbarous had conquered a more civilized race and been influenced by it. Hence the looms, potteries, aud melting-works, &c., which existed in these valleys.

It was no savage who made such a quaint vase as this, Fig. 2, in which to pot his child.

The figures are conventional enough, but they are grouped in a certain typical order. The eyes and the mouth generally form a face, as if to serve for a grave-mask. The figures in the cheeks are quite unique in this instance. The cockatrices in the body of the jar are also curious; but the very remarkable figures in the bottom of third division are frequent enough. In Egypt they would be called the Osiris symbol. We find it among the Zuñis as well as in Catamarca.

I was not fortunate enough to secure the lid of this pot, but they are all more or less represented by the bowl-shaped lid of a child's coffin-jar from Choya, Andalgalá basin, illustrated in Figs. 3 and 4.

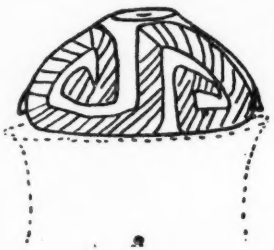


FIG. 3.

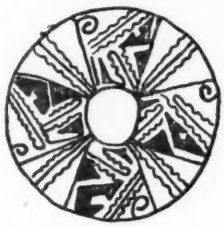


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FIG. 4.

The counterpart of a second specimen collected in the Santa Maria basin, one degree further north.

The pot itself is black on a white slip without polish. The bowls or lids are generally polished except when painted on a white slip, as is sometimes the case.

The line connecting two black triangles over the handles is the usual ornament on the sides of these jars or vases. The blanks

represent a fault in the drawing, which has been destroyed during or after burial by the action of the soil and weather.

Mr. W. H. Holmes, in his "Ancient Art of Chiriqui," has the following very sensible remark:

"They are free-hand products, executed by mere decorators, perhaps by women, who were servile copyists of the forms employed by those skilled in sacred art" (p. 174).

Invading hordes might kill priest and soldier, but would spare woman and child. Thus sacred art would survive an irruption of barbarians, and forms analogous to those of the north might be perpetuated along with relics of the old language, out of which arose the Kakkan or Calchaquí and Diaquita dialect. Old hags would remember that certain symbols were efficacious charms against all evil influences, and would use them again until they became stereotyped and eternal. I endorse Mr. Holmes observation: "A careful study leads inevitably to the conclusion that this was no ordinary decoration, no playing with lines, but a serious working out of a conception every part of which had its significance or its raison d'être (p. 144).

A TRAVELLER'S NOTES IN THE CALCHAQUI REGION.

BY S. H. L. QUEVEDO.

II.

In my last paper I showed how the Chiriquanos buried their dead in jars, and how the same practice obtained in the Kakkan or Calchaquí region.

Father Techo, in his Historia Paraquariæ (p. 148) tells us that the Calchaquí Indians were buried in graves, together with all their belongings, and no doubt we must ascribe to them many of the bodies so found; but the good father does not give any hint of the custom of potting, and it is a fact that potted adults are to be found up and down the Kakkan-speaking valleys. Father Lozano says the Calchaquí tribes built for themselves wattle huts, and as Techo relates how after the funeral the family burnt the dead man's dwelling, it must at least have been combustible.

Even now the Indians in the Calchaquí valleys are very clever at constructing huts with a few logs of wood and wattle. How, then,

are we to account for the miles and miles of country bristling with stone walls? There is not a place of vantage which is not defended with walls and crowded with remains of stone huts.

The valley of Calchaquí proper, on the western slope of the Anconquija range, shows endless lines of constructions of this sort. Besides, we have *tambos*, "inns;" *pucaras*, "fortresses," and towns regularly laid out.

The old historians do not seem to notice such buildings, and they surely must have belonged to a civilization non-existent when the Jesuits entered the country.

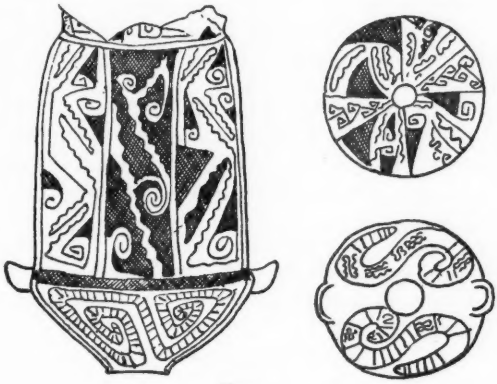

FIG. 5.

Near Santa Maria, at a place called *Fuerte Quemado*, "Burnt Fort," close up against the side of the mountains lying eastward, we find the remains of a town with streets properly laid out. On a mound stood a house or temple approached by stone steps, the dwellings spread up the side of the hill; a little further west stand the bases of three round towers, and not far from these a cemetery, still used as such. It often happens that in digging new graves old potted remains are met with. The pots have been secured, but, unfortunately, so far the bones have been destroyed.

One of the vases is of the triangle, meander, and fret pattern, and is illustrated in Fig. 5, the interior of the lid being shown above, the exterior, below, on the right. The center band is on a white slip, but those on the sides have a red ground, whereas those over the handles again return to white.

The headless double serpents in S or N-like forms are very common.

All these facts speak of at least two races, and what little we know of the craniology of the region also points in the same direction. I give two series of drawings, Figs. 6 and 7, from skulls dug up in the Calchaquí valley, which speak for themselves.

A few miles farther north some other specimens have lately turned up more markedly prognathous and Aymaritic. They were shown to me, together with two others of the C type. The ridge over the eye-sockets of specimen A occurs again in another fragment in my collection, promised to the La Plata Museum.

Specimen C is a drawing of a skull found in the Villavil portion of the Andalgalá or Londres valley. The scale is given in the fourth outline.

The dot at A marks an old dent or healed wound. It may have something to do with the queer lopsidedness in the left quarter of the skull. This skull was given to me by the owners of the property on which it was found, but I could not obtain any further details as to surroundings, etc.

These skulls are by no means exceptional examples; nay, rather, they are fair average specimens. Of course, the student must be on his guard against artificial deformation, so generally practiced on this continent.

Perhaps one of the most curious characteristics is that of the decided prognathism of some of the skulls. History and language both attest the fact that there were blacks in the country before the Spaniards entered. (See Oviedo's account of Almagro's expedition to Chili, etc.) In Quichua they were called *vanacuna*, "blacks" or "servitors." Ethnology has not yet decided whether the name of the color resulted from the service, or *vice versa*, but *vana* is Quichua for "black."

Let us now examine the statements of our historical authorities.

First of all there is Inca Garcilaso de la Vega, a delighlful gossip and one ever to be consulted, but certainly *cum grano salis*. This author's account of the embassy from Tucuman to the court of the famous Viracocha (Com. Real., Lib. V, ch. 26) is a very pretty reading-book story, but is not confirmed by Montesinos or any other writer. It may be true enough in fact, but it does not follow that it really occurred as he dates it. To me it reads very much like an *ex post facto* myth invented to account for the exist-

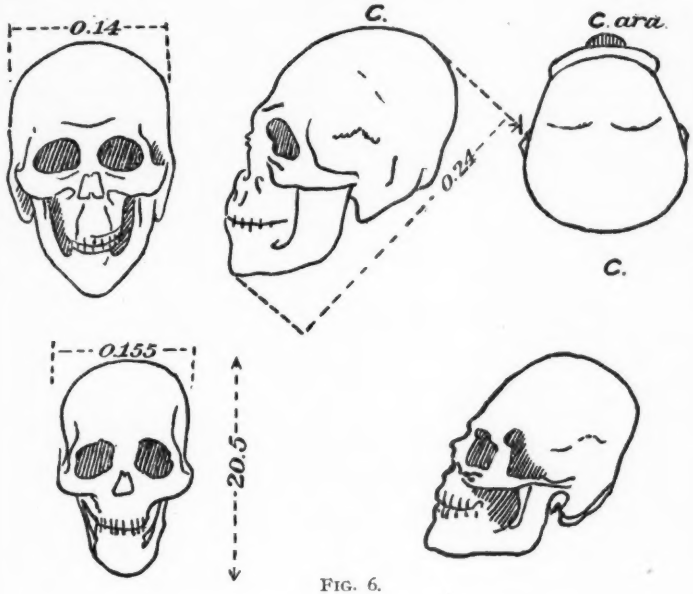

FIG. 6.

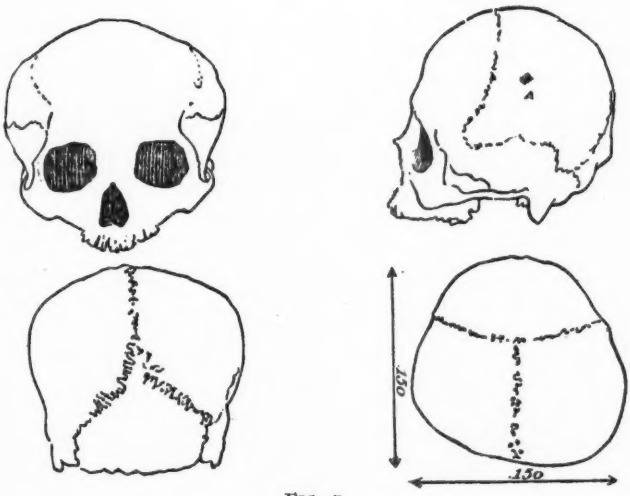

FIG. 7.

ence of Quichua language in what is now part of the Argentine Republic and then was Tucuman in its widest sense.

Herrera in his Dec. VII, Lib. IV, cap. 2, says of this very region of Tucuman: "So it came to pass that the only connection of these Indians with the Incas was a perpetual peace, and their only duty to keep watch over this frontier, to the intent that no men of war might enter therein."

Herrera must have seen the reports sent by the leaders who entered the country, Diego de Roxas and others, and he could not fail to have mentioned some of the pretty things told by Garcilaso of this very Tucuman if they had been in existence.

If we accept Montesinos' account, we at once see how all may be explained satisfactorily. The Incas were only just recovering the scattered fragments of the old Peruvian Empire, shattered by the invading hordes at the beginning of our era.

Garcilaso, to ensure symmetry and a connected narrative, has established his tale of kings, and divided among them all that he could gather as having happened in all time. Others have done pretty much the same thing.

Dr. Brinton runs down Montesinos; Mr. Baldwin upholds his authority, and I must say I incline to the latter's judgment. This is not the place to discuss the relative merits of Montesinos and his rival historians; but we have collateral proof that the Pachacutic of authentic history was the ninth of that name. (See "Antiguedades Peruanas," Madrid, 1879.)

Pachacutic is really a throne name, and is purely chronological, for it means a cycle of 500 years or Pachacutic, *i. e.*, the turning or middle point of a great solar year of 1,000 years. Calculating then each Pachacutic as 500 years, and the Túpac Yupanki, called Viracocha, the ninth Pachacutic as living in A. D. 1400, approximately the sixth Pachacuti would take us back to the first century before our era.

Huaman Tacco Amauta, father of Pachacuti VI, was king when the great earthquakes, signs, and wonders began, which lasted many months. After a five years' reign he was succeeded by Titu Yupanki Pachacuti, "the sixth of this name and sixty-second king of Peru." They called him Pachacuti because, up to his time they reckoned 3,000 years from the deluge, or, say, the fourth sun from the creation of the world; and because in his time there came great armies of most ferocious nations, not only by way of the Andes, but

also by way of Brazil and mainland (tierra firma, or Caribbean coast); there were great wars, and it was then they lost the art of writing, which till then had been practiced; comets appeared, buildings were destroyed, the flying hordes forced each other out of their lands; all was panic and confusion. "And then he heard how hosts of men were marching on him by way of the Collao (Bolivia), and that the ferocious savages who came from the Andes were drawing nigh, and that some of them were *blacks;* and so also those of the lowlands." (*Ibid.*, etc.)

Pachacuti went out to meet them, but was slain, his army routed, and his empire destroyed. So ended the early monarchy; and the fugitives escaped to Tamputocco, where they lived on for one thousand years, one great solar year or two Pachacutics. (Montesinos, Memorias, pg. 79, sqq., Madrid, 1882.)

Tupac Cauri, the seventh Pachacuti (A. D. 400?), began to extend his dominions. During his reign a frightful pestilence ravaged the land. People fled to the Andes and to Xauja.

In the time of Toco Cozque, fourth king after Pachacuti VII, fresh hordes arrived from Panamá and the Andes, Sodomite races, some of them related to the Pijaos and Paeces.

In the reign of Inti Maita Capac we come to the 4,000th year after the deluge, or the eighth Pachacutic, under which name the above monarch figures in the list of kings.

There is nothing in all this at all unlikely; indeed, if we accept it as history we shall be able to explain many of the mysteries of pre-Columbian America. Such names as Manco Cápac may be read as King of Wanucu, for *càpac* means "king," and *Huanucu* is a name connected with old cities of Perú, Huanucu and Tia-Huanaco.

In this account we see a sufficient cause for all the racial and linguistic confusion which we have noticed in the whole of the Calchaki or Kakkan-speaking region of the Argentine Republic. As a fragment of the ancient Peruvian monarchy it would preserve its Quichua tongue, but by the side of it we could have the Araucan and Kakkan languages, as the names of places even now testify. But if it should be proved that the Quichua of the Argentine Republic began as late as the year 1400, we should still have to account for mixtures, as, for instance, the notorious existence of Chilean or Araucan nations and names of places in the Calchaquí or Kakkan valleys.

Races may have been mingled in post-Columbian times, but the mixture is observable in the various discoveries made even in the oldest cemeteries. Montesinos enables us to account for all this; his interpretations of the songs and not records (*Kipus*) tell of invading hordes from Chili, Tucuman, Brazil, and the Carib mainland. Why, then, doubt the good faith and historic accuracy of the only author who has written something with a natural ring about it? Other writers have made up a pretty story; Montesinos has written down what the Amautas told him. His account is full of lacunai and difficulties; so much the better. I may not have proved anything, but I hope to have awakened interest in some things not generally known. I may be bold in preferring Montesinos to Garcilaso, Cieza de Leon, Betanzos, Herrera, Acosta, and others; but it will be time enough to accept their symmetrical improbabilities when all their many contradictions are explained away. The short list of the Inca dynasty is confused enough, and after reading Montesinos we can readily account for it all, because we at once perceive that they have reduced to a connected narrative, spreading over the short space of 400 years, events probably belonging to as many thousands. For them one Pachacuti was enough to carry the feats and misfortunes of nine, and hence it is we see such ridiculous contradictions as seem to hover round some of these kings, who here appear as heroes, there as cravens. Let the student enter the Calchaqui region with Montesinos in hand and he may then learn to value his authority higher than that of other writers hitherto held in more esteem.

III.

The Yucatec BACAB *and the Quichua* HUACA *or* WACA.

The Maya word *bacab* is the plural form, signifying: (1) "Vases with a narrow neck, bearing the head of an animal or of a human being, which were filled with water and set up in the four corners of the idols' temple;" (2) "Other vases, in which the entrails of the dead were preserved;" lastly, (3) "Names of the four greater deities, depicted in those vases, and called the pillars of heaven."

From the Spanish, as quoted by Brasseur de Bourbourg:

Waca, also spelled *baca*, as in Baca-marca, name of a place near Santa Maria, of Calchaquí, means "an idol," "anything buried or

sacred." This Quichua term has several significations, and is often used in the sense of deity, or of a pot containing some object of reverence which had been buried.

Spanish B is often substituted for the Indian W sound; but the plural ending -b in Yucatec would be *-cuna* in Quichua, and we find *Waca-cuna* as the plural of *Waca*.

According to Rivero, as quoted by von Tschudi in their "Peruvian Antiquities, *Conopa*" are certain idols of the ancient Peruvians, something of the nature of the Roman *Lares*."

According to Brasseur de Bourbourg, *Canob* is the name given to the four *Bacab*. We may not, of course, be too sure of the identity.

Canob is equal to Canopa, even though the former does mean "heavens," "God's;" and *Con* is said by von Tschudi to be the name of God of the ancient Peruvians, the father of Pachacamac.

Let me now refer my readers to the 1881–'83 volumes of the "Bureau of Ethnology," where they will find a pretty full description of the Bacab painting. In the plate we notice, besides vases, sitting figures, etc., several series of dots and curious symbols after this fashion:

These steps or stairways accompanied by fillets, borders, dots, etc., are very common in Calchaquí pottery, and nowhere more so than in the coffin-jars of the meander type.

The accompanying sketch, Fig. 8, is from a vase in my collection which represents a type of which I have seen some six specimens, more or less perfect. All I know about it is that it was dug up in San José, in the Santa Maria valley, in the Tocavil division of the Calchaquí region. It must have contained a child's bones, because all such vases, when they have a history, do contain them.

The skull has a marked type of its own, but is in pieces. It probably belongs to class C, Fig. 6.

In this vase we have a collection of most of the principal art symbols in Catamarcan antiquities, and therefore I selected it for illustration.

The pot itself is more or less typical in shape. It has a neck with a bell-like lip, broken off in this instance. The waist, or slight depression in the line of the handles, is sometimes represented by a marked division in the pattern.

The material is a rather light-colored, not very fine clay, without polish, painted over with a whitish slip. This carries the pattern in deep black and purple, but the dark lines enclosing the

latter color in the meander to the right are edged with a lighter fillet, as seen in the drawing.

FIG. 8.

Each face of the vase seems to be a perfect composition enclosed within a frame of black, *a*, which runs up the sides past the handles, along the edge of the lip or rim, and is connected with the black triangles which fill up the space between the two purple arches. In some vases the lateral border is thus, *b*.

a. *b.*

We next have the arched eyebrows. These curves are very general, and by no means limited to the face details. The eye symbol is sometimes painted on the flat; at other times raised in relief, and colored or not colored. By right, the mouth should have been painted a little below the junction of the curves.

As far as can be made out, it is absent in this instance. Of course, I cannot account for the omission. The cheeks are peculiarly treated. To the right a spherical triangle in purple, charged with two rayed and centered suns or stars in black, is enclosed within a border containing these symbols:

Angles, dots, wavy lines, stepped triangles with frets are very common in all Catamarcan art. The left cheek bears a shield with the ground and pattern counter-changed. The suns in the border here are three, and the fretted triangles in the upper part elongated to fit the space. A black line divides the neck from the body of the vase, and below this line a broad band breaks up the pattern into two halves. This band is made up of black fretted triangles, of which the middle one is purple edged with black.

The main design may be described as a black bordered purple meander separating three groups of triangles, stepped and dotted.

The details on this pot should be compared with those on the Wolpi pottery figured in the 2d Report of the "Bureau of Ethnology," Smithsonian Institution.

Frets as complicated in color and design as that figured to face page 381 (41,363) are not rare. I possess a very beautiful example in black and red on a yellowish-white slip.

The stepped frets are also very generally found in North and South America. Ch. Wiener's "Pérou et Bolivie," pp. 759, etc. The author there reproduces several sere-cloth designs, and they all remind me of the Calchaquí pot and of many others found up and down the country.

Fortunately I own three very beautiful vases of this type, two of which are still on their way from the Calchaquí region. The general treatment is very similar, but some of the details differ. For instance, in the two other vases the mouth is present, and the cheeks are ornamented with serpents instead of shields; but the serpents bear fretted and stepped triangles. In one specimen, which was sketched before packing, the purple meander assumes the form of a zigzag.

It is impossible to ignore the fact that these stepped pyramids and triangles must have a symbolical meaning, if we carefully examine

Wiener's reproduction of the Paramonga cloth, page 761. They occur in connection with sepulchral art of some kind or another, and they constantly remind us of the Isis and Osiris hieroglyph.

The possible affinity in an Egyptian direction may lack probability; not so the analogy with the Wolpi and Peruvian examples.

In my little work on "Londres and Catamarca" the frontispiece reproduces a photograph of a very beautiful copper disk. Nothing can exceed the delicacy with which the frets have been worked into the mold. The disk and the pot may or may not belong to the same period, but we must allow that they have many details in common.

It is a great pity that the Chimu and Tia-Huanaco fields have not been systematically explored, because we would then be able to distinguish between the different epochs. The Incas were certainly not the authors of the extinct Tia-Huanaco civilization, and it is probable that the Chimus we know were likewise rather the destroyers than the children of that which goes by their name.

In Catamarca it is not possible to credit the semi-civilized Diaguita and Kakkan tribes with the art objects which constantly turn up.

The Tia-Huanaco-like head, nobly sculptured in stone, now in the La Plata Museum as part of my own collection, must have been produced by a guild of artists in stone. Copper chisels constantly turn up in digging trenches, etc., and these must have served as sculptors' tools.

Here a question suggests itself: What could have been the object of these vases ornamented with human or animal faces? Perhaps a ritual tradition that they could scare evil influences away. In fact, they served the purpose of the mask in other regions. Sherds with the face pattern still entire have been found laid on a corpse buried in a common grave.

In my collection I have many of these human-faced pots, Fig. 9, which would exactly answer the description of the Maya *Bacab*.

There is an endless number of specimens with faces and animal shapes plastered on as handles and ornaments. But we must wait until the La Plata Museum publishes an illustrated catalogue of its rich collection of Argentine antiquities. Many of my own best specimens are likewise in the director's hands, and the balance I hope to make the subject of a monograph now preparing for the press. I have said enough, however, to call attention to the importance of

the Calchaquí or Calchakkee valleys as a field for exploration. But for the political and financial crisis in the river Plata, Dr. Moreno would have long since issued his reports or annuals, which most certainly will open up a new chapter in the history of South American archæology.

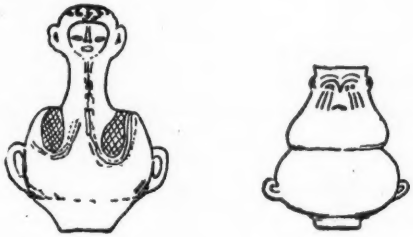

FIG. 9.

These papers have been jotted down in the midst of many interruptions and pressing business, but they will serve to show that in the Argentine Republic we are already awake to the necessity of collecting and classifying material after the manner of the Smithsonian Institution's Annual Reports.

THE PANAMINT AND SALINE VALLEY (COL.) INDIANS are the same, speaking the same language, intermarrying constantly, and having constant intercourse back and forth.

Of the foregoing facts I have been told by at least a half dozen of the most intelligent Indians living in both localities. A few of the same Indians live on Cottonwood creek, flowing into the northwestern arm of Death valley, but the larger part of them make their home in Saline valley.

In this latter locality the Indians all live at one place on the west side of the valley, at the base of the Inyo mountains and near the border of the salt-bed which covers the sink of the valley. A small stream of water flows out of Hunter's cañon, in the Inyo mountains, about a mile from the Indian village, and furnishes them with water for irrigating purposes.

They have about one hundred acres of land enclosed, and some of it planted in alfalfa, and they are increasing their acreage of this

crop the present season. They also grow melons, squashes, corn, beans, barley, and wheat.

The alfalfa, barley, and wheat raised they sell readily to the Borax Company, whose borax works are located less than a mile from the Indian village.

This company pays the Indians a small royalty for the use of water during the irrigating season. These Indians have four American plows and seven scythes, and say they are going to buy a mowing machine next year.

Some of them find continuous employment, at fair wages, at the borax works.

Their houses are both square and dome-shaped, and made of wattled straw or brush laid over a frame-work. They also have a small grape and peach orchard.

The Cottonwood Creek people number only two or three families, except during the grass-seed or piñon-nut gathering seasons, when many of the Saline Valley people go over there for a time. The supply of water is very limited here and only a few melons are raised, with an occasional effort at corn and beans on a little enclosed patch of ground.

Panamint.—In the main Panamint mountains the Indians are located in two small groups. One is at the mouth of Hall's cañon, a mile north of the Hot Springs, on the east side of Panamint valley, close to the base of the Panamint mountains. They get water for irrigation from Hall's Cañon creek, and raise corn, beans, melons, and squashes, and are starting a small fruit orchard of peaches and figs.

On the east side of the Panamint mountains, at a place marked "Johnson's R," is a series of three or four little patches of soil along the course of a steep rocky cañon leading down into Death valley, just south of Bennett's mills.

There a couple of families manage to live by raising corn, melons, squashes, and a few peaches and grapes, with pine-nuts and grass-seed in their season. This ends the list of these people, and covers all of their stations. They all use houses like those in Saline valley and all own ponies.

All told, these Indians must number less than one hundred. The men are very fair workers and find employment at times about the mining camps of Panamint, Darwin, and elsewhere.

E. W. Nelson.

FRAGMENTS OF THE HISTORY OF A LOST TRIBE.

BY DR. LORENZO G. YATES.

During an interview had about three years ago with one of the few representatives of the Indians who formerly inhabited the region round about Santa Barbara, California, the following notes were made from statements of Justo, a Santa Barbara Indian, in answer to questions in relation to their habits and customs, which, in view of the fact that the aborigines of the region referred to are almost, if not entirely, extinct and the opportunities for learning anything in relation to them have passed away never to be again offered, may be considered worthy of record.

Through the kindness of a friend, who at a cost of some considerable trouble and outlay of money had brought together some of the oldest and most intelligent of the few living representatives of tribes which formerly occupied the islands and mainland of Santa Barbara county and adjacent country, an excellent opportunity was offered to learn something of the habits and customs of an almost extinct people.

The following notes were jotted down from the answers to questions which were slowly and carefully asked of Justo and which he answered after consulting with his Indian friends who were present (representatives of different tribes):

He stated that at the age of about ten years he accompanied the expedition which brought the remnants of the Indian tribes from the islands off the coast of California and distributed them at the missions of Ventura, La Purissima, Santa Barbara, and other localities on the mainland.

He had been told by his uncle that when the Indians of Dos Pueblos (Santa Barbara county) first saw a Spaniard on horseback, the Indians, who had been assembled in the "sweat-house" (*Te-mas-carte, or Te-mas-cal*), rushed out to witness the (to them) wonderful sight. The Spaniard in alarm threw his lance among them and fatally wounded one of their number. In revenge for this the Indians killed him with their arrows.

When Justo was a small boy he had witnessed some fighting at the Estero, about one mile from the city of Santa Barbara, between the Indians of El Rincon (a point about 15 miles distant) and those who lived where Santa Barbara is located.

Their method was to open a battle by tossing up a lot of feathers. One Indian would leave his companions, advance toward his enemies, and shoot a number of arrows, which were generally dodged by the opposing forces. When the Indian got tired he retreated or fell back, and another would advance.

The fighting did not result in much loss to the participants. In the instance referred to, the Santa Barbara Indians lost one of their number; the Rincon party, two.

He stated that the arrows were sometimes poisoned.

When a declaration of war was made a messenger was dispatched by the aggrieved party, who repaired to the tribe with whom they desired to open war, with a polite invitation to meet at a certain place and on a stated day.

On the day agreed upon the opposing parties, painted and equipped for the fight, repaired to the proposed battle-ground and opened fire by throwing handfuls of fine feathers into the air, accompanying the action by certain peculiar sounds and a repetition of ya, ya, ya, ya, ya, ya, ya, ya, ya, ya, increasing the rapidity of enunciation until it culminated in the exclamation *Wau-Kap-pée!!!*

In these battles very few were killed; but the fighting was continued for some time after the loss of a man by either party.

When either side was satisfied they built a fire, which signified that their opponents were valiant warriors, and that *they* were satisfied and wished to bury the hatchet for the present.

Dwellings.—Their houses were made by placing sticks of sycamore wood so as to form a conical building, which was covered with tules, leaving an opening at the apex for the escape of smoke. The fire was placed in the center.

The ground in the interior was smoothed off, and dirt thrown up around the base at the outside to keep the water from running under.

On the islands, bones of whales were used instead of sticks, at least in some instances, the writer having been present at the exploration of their sites.

Sleeping.—They drove forked sticks in the ground, across which other sticks were placed, and on these mats of woven tule were spread, upon which the inmates slept.

For covering, the Indians on the islands used blankets made of skins of birds and sea otters, and also rabbit skins; the last named he estimated to be worth about $2.50 each.

Eating.—On short days they had two meals a day.

Squirrels were usually cooked. Birds were killed by small-pointed arrows. Grasshoppers were not used as food here, but the Indians farther down the coast made pinoles of them, which they ate.

Chilla (a gelatinous seed) was also used as food, from which a great loaf was made and cut into slices.

They knew nothing of the use of salt.

Acorns were largely used, which were harvested and stored up. A kind of filter shaped like a basket, and called chaleel, was used to get the bitter out of them, which required three washings to be palatable.

The wild cherry (islaya) was boiled, and bruised in a mortar; the seeds or pits were taken out. Both pulp and seed were used as food.

Their meat consisted of squirrels, birds, sea otter, seals, and whales, which last was called páhát. When they found a whale they had a big feast. If there was enough to go round, it was all right; if not, they had a general fight over it.

Fish were generally roasted or baked in holes in the ground, but they were considered best when boiled.

Bait.—Black mussels were largely used as bait, the fish-hooks being made of bone and shell. Justo recognized figures shown him in Wheeler's Report.

Hunting Ducks.—They built an enclosure of tules, leaving an opening through which the ducks were driven. The hunters followed them into the enclosure and captured the game.

For catching rabbits they used a kind of "figure 4" trap, with a stone suspended so as to fall upon the game.

Dress.—The men wore a kind of jacket made from the breasts of water fowl. The women wore two buckskins tied around the waist, falling to the knees, and a kind of petticoat made of tule.

Beard.—Some of the Indians had beards, which they plucked by the aid of pieces of shell.

The medicine men were called *Ach-ie* and were celibate.

The men had one wife each. There was no marriage ceremony and no provision for divorce. No price was set or offered for a wife, but a suitor insinuated himself into the good will of the family of his intended by showing his skill in hunting and collecting seeds.

Burials.—Various methods of burial were practiced, of which much has already been written. Among other things buried with the dead, quartz crystals were mentioned as being admired for their beauty.

It is much to be regretted that so little has been learned in relation to the habits and customs of tribes which formerly occupied the islands off the coast of California, and who were in many respects much more advanced in aboriginal art than the tribes who occupied the mainland, aside from those branches of the same tribes who inhabited the coast region of Santa Barbara and Ventura counties.

When Mr. H. W. Henshaw visited the region, several years ago, only one Indian remained of the Santa Rosa Island branch, and two more dialects were spoken by two or three individuals only, and it is more than probable that some of those branches have since become entirely extinct.

THE COCOANUT PALM IN THE GILBERT ARCHIPELAGO.—"The cocoanut palm flourishes very well . . . in this climate; therefore the island [Nonouti] is covered with it, and it is the entire wealth of our poor people. The cocoanut tree gives them its fruit for food, its wood for building their dwellings and their boats, its wide leaves for roofs. They extract oil from the cocoanut by scraping and boiling it, and with the husk of the nut they make excellent ropes. The sap of the cocoanut tree, which they collect by making an incision close to the bud, furnishes them with an excellent but heady beverage, stronger than the liquid contained within the nut, and which easily turns to vinegar. If, however, it is cooked as soon as collected, it becomes excellent molasses, which they use to sweeten their food. In addition, the shells of the nuts make vessels which are less fragile than glass, or, indeed, if burned, make a very hot fire, being impregnated with the oil of the nut. The same is true of the leaves, which are used for torches, and which give a brilliant light in burning. The cocoanut tree, then, is almost able, by itself, to supply all the needs of the inhabitants of these countries." [Bulletin de la Société de Géographie de Lyon, Nov., 1890, page 319.]

JOHN MURDOCH.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY O. T. MASON.

This democratic, peripatetic association met in Washington, August 17–24. There were seven hundred in attendance, this was quite above the average and very encouraging for Washington, which has the reputation of being excessively hot in August. Among our foreign visitors interested in Anthropology were Mr. Henry Balfour, of Oxford; Professor Hughes, of Cambridge, England, and Mm. Gaudry and Boule, from Paris. In addition to the papers read in the Anthropological section, there were others in the various sections which bore directly on this subject. Indeed, the presidential address of Professor Goodale was a remarkable example of precious gifts which men in other branches of learning may contribute to the science of man. His theme was the possibilities still undeveloped in the vegetable world. As every one of our food-plants and timber-trees and all our forage and textiles were contributions of nature in a wild state, we may look to nature still with hope for other supplies. It is not possible that we can have exhausted her bounty. The speaker urged upon our experiment stations the duty of prosecuting inquiries in this direction instead of leaving the work to private speculation or accident.

Section I, Economic Science and Statistics, is devoted purely to Anthropology, and in many instances in the highest sense. If natural science is the application of instruments of precision to the study of any subject, then many of the papers read in Section I were truly anthropological. A list of these will speak for itself:

The Census counting machine. By Dr. J. S. Billings, U. S. A.
The science and art of government. By Lester F. Ward.
The Southern old fields. By W J McGee.
Agriculture by irrigation. By R. J. Hinton.
Water management. By B. E. Fernow.
State supervision of railway extension. By B. W. Snow.
The code of inheritance. By Richard T. Colburn.
Artesian wells and underground waters in Texas. By R. T. Hill.

Others, of a more speculative character, have no place here.

The vice-presidential address of Section H, was delivered by Professor Joseph Jastrow, of Wisconsin, on the evolution of the argument from analogy. Beginning with savagery, where the most distant and loosely connected phenomena furnish ground for conclusions, it was possible to trace through more refined grades of culture the improvement of the apparatus of argument itself.

The papers read before the section were as follows:

The essentials of a good education, with a new classification of knowledge. By Wm. H. Seaman.

The custom of kava drinking as practiced by the Papuans and Polynesians. By Walter Hough.

A linguistic map of North America. By J. W. Powell.

Jade implements from Mexico and Central America. By Thomas Wilson.

Gold ornaments in the United States National Museum from the United States of Colombia. By Thomas Wilson.

Siouan onomatopes, interjections, and phonetic types. By J. Owen Dorsey.

On a collection of stone pipes from Vermont. By G. H. Perkins.

The importance and methods of the science of comparative religion. By Merwin Marie Snell.

An experiment in human stirpiculture. By Anita Newcomb McGee.

Relics of ancient Mexican civilization. By Zelia Nuttall.

Bow-stretchers. By Edward S. Morse.

Prehistoric bows. By Edward S. Morse.

The Nez Percé country. By Alice C. Fletcher.

Relation of a Loveland, Ohio, implement-bearing terrace to the moraines of the ice-sheet. By Frank Leverett.

Utility of psychical study of child life. By Laura Osborne Talbott.

Origin of the name Chautauqua. By Albert S. Gatschet.

Outline of creation and migration myths. By F. H. Cushing.

An ancient human cranium from Mexico. By F. W. Putnam.

The length of a generation. By C. M. Woodward.

Burial custom of the Hurons. By C. A. Hirschfelder.

The Messiah religion and the ghost dance. By James Mooney.

Study of a dwarf. By Frank Baker.

Stone drills and perforations in stone. By Atreus Wanner.

Evidences of high antiquity of man in America. By Thomas Wilson.

Bone, copper, and slate implements in Vermont. By G. H. Perkins.

Some archæological contraventions. By Gerard Fowke.

Distribution of stone implements in the tide-water province. By W. H. Holmes.

Games of Teton Dakota children. By J. O. Dorsey.

Geographic arrangement of prehistoric objects in the U. S. National Museum. By Thomas Wilson.

Curious forms of chipped implements. By Thomas Wilson.

Inventions of antiquity. By Thomas Wilson.

Study of automatic motion. By Joseph Jastrow.

Race survivals and race mixtures in Great Britain. By W. H. Babcock.

The paper of Professor Seaman is an attempt to arrange the education of youth on the natural relations of the sciences.

LANGUAGE.	MATHEMATICS.	
	Pure.	*Applied.*
Ancient.	Arithmetic.	Surveying.
Modern.	Algebra.	Topography.
Elocution.	Geometry.	Astronomy.
Grammar.	Calculus.	
Philology.		
Rhetoric.		
Logic.		Mechanics.
Drawing.		
Painting.		
Music.		
Sculpture.		

CHEMISTRY.		BIOLOGY.	
Molecular.	*Atomic.*	*The Anatomy and Physiology of Plants and Animals.*	
Gravitation.	Descriptive.	Fungi.	Protozoa.
Heat.	Theoretical.	Algæ.	Metazoa.
Light.		Lichens.	Insects.
Electricity.		Mosses.	Reptiles.
Magnetism.		Ferns.	Fishes.
		Phenogams.	Birds.
	Mineralogy.		Mammals.
	Geology.		History.
			Sociology.
			Psychology.

Mechanics, mineralogy, and geology are "connecting links."

Mr. Hough has collected from various sources the details of kava drinking and the reports of its effects on the system.

Major Powell's communication was an exhibition of a linquistic map of North America, the result of an inquiry extending over twelve years and combining the studies of all who from the first mention of a tribe to the present moment have contributed to the

construction of a map. Civilization has almost entirely swept away the living representatives of this primitive culture, but Major Powell's map will remain the chart of savage occupation of the continent.

Mr. Wilson's brief paper on jade was long enough to stir up the old controversy on the question of its source, but no progress was made in its solution.

Mr. Dorsey gave a brief discussion of a linquistic topic, the full account of which will appear in the publications of the Bureau of Ethnology.

The paper of Mrs. McGee described the experiment of Noyes in the Oneida Community and gave the result. This paper appears in the present number of the magazine.

Mrs. Nuttall sent to the Association an accurate color sketch of an old Mexican feather shield now in the castle of Ambras, in the Tyrol, with a study of this style of work and a discussion of the shield itself.

Professor Morse, in continuation of his studies in primeval archery, discussed some very primitive forms of bows, and also a relic of the Bronze Age, supposed to have been used in stringing or in stretching the bow.

Miss Fletcher offered a map of the Nez Percé country, drawn by an Indian of that nation, and compared it with the best work of our Land Office.

Mr. Cushing read a long and copiously illustrated paper, giving the results of his study in the mythology of the Zuñi Indians during a residence of several years among them. This paper will appear in the publications of the Bureau of Ethnology.

Mr. Mooney's communication was of great interest to the section. After spending two months in Oklahoma and the Indian Territory, dancing the ghost dance with the Indians, he was able in the most graphic manner to reproduce the scene and give a logical account of its motive. It appears that the Indians having failed to rid the land of white men have now appealed to the ghost world and the Messiah to help them.

All of the other papers in the list following Mr. Mooney's were read by title and will appear by abstract in the Proceedings.

This account should not be closed without mention of the Woman's Anthropological Society, some of whose members read excellent papers before the section, and all of them were most assiduous in their attentions to the Association.

MAPLE SUGAR AND THE INDIANS.

BY A. F. CHAMBERLAIN.

Since the article on "The maple amongst the Algonkian tribes" appeared* I have come across some very interesting evidence not previously noted. In the "Gentleman's Magazine" for 1765,† we find the curious information that "The *Americans* have discovered a method of making sugar from a liquor procured by boring the maple tree." In the first volume of the "Philosophical Magazine"‡ there is printed a letter from Dr. Robinson to Mr. Ray, bearing date of "London, March 10, 1684," which is as follows:

"I have enclosed you some sugar of the first boiling got from the juice of the wounded maple. Mr. Ashton, Secretary to the Royal Society, presented it to me. 'Twas sent from Canada, where the natives prepare it from the said juice; eight pints yielding commonly a pound of sugar. The Indians have practiced it time out of mind. The French begin now to refine it and to turn it to much advantage. If you have any of these trees by you, could you not make the trial, proceeding as with the sugar cane?"

In his reply, which is dated "Black Notley, April 1, 1684," Mr. Ray says: "Yours of the 10th instant I received and therein an enclosed specimen of the Canada sugar, a thing to me strange and before unheard of." Mr. Ray also mentions that he had a friend experiment for him, in the way suggested, with some success.

The important fact to be noticed here is that as early as 1684 we have the distinct statement regarding maple-sugar making, that "the Indians have practiced it time out of mind."

In Vol. XV (1684–'5) of the "Philosophical Transactions of the Royal Society"§ there is "An account of a sort of sugar made of the juice of the maple in Canada," presumably from the pen of Mr. Ashton above referred to. This brief note is as follows:

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* Vol. IV, pp. 39–43.

† Vol. XXXV, p. 439.

‡ Vol. I, pp. 322–323, "Of an attempt to make the maple sugar above an hundred years ago."

§ No. 171, May 20, 1685, p. 988.

"The savages of *Canada*, in the time that the sap rises in the *maple*, make an incision in the tree, by which it runs out; and after they have evaporated eight pounds of the liquor there remains one pound as sweet and as much *sugar* as that which is got out of the canes; part of the same *sugar* is sent to be refined at Roven.

The savages here have practiced this art longer than any now living among them can remember. There is made with this *sugar* a very good syrup of maiden hair and other capillary plants, which is used in *France*."

Here we have the very important statement made in 1684 that "the savages have practiced this art longer than any now living among them can remember." It would appear from the evidence of Mr. Ashton and Dr. Robinson that the statement that the French in Canada learned the art of maple-sugar making from the Indians is true.

There is also some additional evidence regarding the history of maple sugar in New England. In Vol. XXXI of the "Philosophical Transactions of the Royal Society"* we find "an account of the method of making sugar from the juice of the maple here in New England," by Paul Dudley, F. R. S.

Following is part of Mr. Dudley's interesting description:

"Maple sugar is made of the juice of upland maple, or maple trees that grow on the highlands. You box the tree, as we call it—*i. e.*, make a hole with an axe or chisel into the side of the tree, within a foot of the ground. The box you make may hold about a pint, and therefore it must shelve inward or toward the bottom of the tree. You must also bark the tree above the box to steer or direct the juice to the box.

"You must also tap the tree with a small gimlet below your box, so as to draw the liquor off. When you have pierced or tapped your tree or box you put in a reed or pipe or a bit of cedar scored with a channel, and put a bowl, tray, or small cask at the foot of the tree to receive your liquor, and so tend the vessels as they are full." This method of procedure in 1720 may be compared with that now in use, and that in use amongst the various Indian tribes.

Ben. Perley Poore, in an interesting sketch of the "History of the Agriculture of the United States,"† says of the New England

* Vol. XXXI (1720–1721); January, April 1720, pp. 27–28.

† Report of Comm. of Agriculture, 1866, pp. 498–527.

Indians: "From the sap of the maple tree they made a coarse-grained sugar, which, when mixed with freshly pounded "sup-paun" and seasoned with dried whortleberries, was baked into a dainty dish for high festivals" (page 500).

Descriptions of the modern method of maple-sugar making in Vermont, "the maple-sugar State," may be found in the reports for 1867* and 1873,† and interesting statistics of maple-sugar production in that for 1876.‡

In the report for 1862§ Mr. C. T. Alvord, of Wilmington, Vermont, has an interesting paper on "the manufacture of maple sugar." He states:

"From the earliest settlement of New England to the present time the manufacture of sugar from the sap of the maple tree for domestic purposes has been carried on as one of the branches of agricultural pursuit" (page 394).

In the interesting description which he gives of the method of manufacture (pages 397–405) the following passages deserve particular notice:

"In some instances the syrup was strained through *hemlock* boughs and then boiled down to sugar" (page 398).

The way to tell when the sugar is boiled enough is "by having a dish of snow and putting some of the hot sugar on the snow. If it does not run into the snow, but cools in the form of wax on the surface of the snow, it is done enough to be put in the tubs to drain" (page 403) ||.

The comparison of the earliest recorded methods employed by white men and by Indians seems to lead to the same conclusion as the linguistic evidence already adduced, and to strengthen the belief that the American Indian first manufactured maple sugar.

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*P. 246. †Pp. 473–5

‡Pp. 159–160. §Pp. 394–405.

||Compare Report of Comm. of Agric. 1870, p. 412, where it is said of some Western Indians: "Sugar-making forms a sort of Indian carnival, and boiling candy and pouring it out on the snow to cool is the pastime of the children."

KAHASTINE^{N}S OR THE FIRE-DRAGON.—Among the unlettered Iroquois there is still current a belief in the existence of enormous and tri-form monsters, having the head, breast, and shoulders of a panther, the wings and claws of an eagle, and the body of a huge serpent.

Its mouth and eyes are said to emit fire and balls of light, and lambent flames are reputed to play over its entire length, which is said to be about two bow-shots; its other proportions are such as to correspond with its vast length.

Its abiding places are at the bottom of great lakes, and its mode of locomotion is by flying. Its time of flight is at night, making its way across the country from one lake to another. These people fancy that they can hear the waters boil and siss when the flame-enveloped monster plunges into a neighboring lake. In their ignorance of the facts of astronomy, these people believe that eclipses of the sun and moon are caused by these monsters attempting to feed upon or swallow the planet in eclipse.

To prevent a catastrophe so dire as the loss of one or the other of these their celestial ancestors (for the sun is their elder brother and the moon their grandmother), the terror-stricken people shout, shoot arrows at the supposed monster, urge their dogs to bay and howl at it, and beat drums and kettles to frighten the demon away.

The origin of this myth is traceable to the meteor or falling star. The Tuskaroran name of it is *Kahasti'nē^{n}s;* its Mohawk name *Kahaseri'ne's*, and its Onondagan was formerly *Kahasĕñdye'tha'*.

In these sentences or sentence-words the initial *ka* is the neuter zoic pronoun "it;" the nominal base is the stem of *ohă'sera'*, "a light or flame," from an original *ohathe'sera'*, "light-giving thing." The verb in the first two is from *-i n e'*, "to move or travel," while that of the last *-ĕñdyetha'*, denotes "to cause, to emit, or shoot." Here we have evidence that the "shooting light or star" is the origin of the fabulous fire-dragon. The Onondagan name is now applied to the lion of the eastern hemisphere.

J. N. B. HEWITT.

ABORIGINAL ROCK-MORTARS NEAR EL PASO, TEXAS.

BY H. L. BRUNNER.

The location of these excavations is on the east side of the Franklin mountains, about ten miles north of El Paso, near the mouth of a cañon containing a spring known locally as the House spring. An extensive view is here afforded of the mesa to the east and north. The mountains in the vicinity contain much intrusive granite, which a short distance below the mouth of the cañon rises in two low knolls above the detritus washed down from the mountains. One of these, a bare knob, contains a small number of excavations; the other, partly covered with loosened masses of granite, has thirty-two.

The excavations themselves—"cooking holes" they are sometimes called—vary from ten to fifteen inches in diameter at the mouth, and from fourteen to nineteen inches in depth, being semi-spindle-shaped. The largest measured nineteen inches in depth by fourteen inches at mouth; a small one was fourteen inches deep by ten inches at mouth. Twenty of these holes lie close to and partly in the shadow of a large tilted block of granite, which, besides shade, may have furnished a shield from hostile eyes. Fourteen holes are nearly perfect, particularly those most shaded; five made near the edge of the rock have been partly worn away by disintegration, and one has been opened lengthwise by a fracture of the rock. Scattered among these larger "holes" are perhaps thirty small ones, saucer-shaped or slightly deeper, and varying from six inches wide and three inches deep to two inches wide by half an inch in depth. Seven of these are about of the larger size, but the majority are quite small. They are all rounded at the bottom, whereas the larger holes are more or less pointed.

Within ten paces of this larger group, in separate blocks of granite, two smaller groups are found, consisting respectively of five and seven large excavations, some of them well preserved.

Old plainsmen say these holes are mortars, used for the grinding of grain. A single tool was found, which may have been used in this process, and will be mentioned further on. The smaller exca-

vations above described were probably used to hold round-bottomed vessels and cups.

A few fragments of pottery, both plain and decorated, were picked up, but were not different from the cheaper Mexican ware. An "arrow-scraper," a small implement with a concave sharpened edge, was found, and also an unwrought ax-shaped stone, which had been used for digging or chopping.

About one-third of a mile below the excavations, presumably transported by water, an oval lenticular tool of hard sandstone was found, its greatest length, breadth, and thickness being respectively 4½, 3¼, and 1⅜ inches. One surface is rough, but has been worked to produce its present curvature, which is greatest toward the ends. The form exactly fits the hollow palm of the hand. The other surface is smooth, curving most toward the sides, and showing slight longitudinal scratches. Moreover, the longitudinal axis of curvature makes a small angle with the line of greatest length, which fact, with its occurrence near the mortars, its shape and markings, suggests that the stone was held in the concave palm either in shaping the mortars themselves or in grinding their contents, or possibly for both purposes.

Other similar excavations are reported near Mundy spring, a few miles north of the above locality.

FLORES AND CELEBES.—An important contribution to the ethnography of these islands has just been published as a supplement to volume 3 of the *Internationales Archiv für Ethnographie.*

It is by Dr. Max Weber, of Amsterdam, who spent the period from April, 1888, to March, 1889, in a journey through Sumatra, Java, Celebes, Saleyer, and Flores for the purpose of making zoological investigations. While zoology was the main object of his journey, he felt that, to use his own words, "The duty of collecting ethnographical objects, as far as time and opportunity permitted, in a region where the leveling effects of western civilization are so rapidly showing themselves, must impress itself even upon the layman."

Accordingly a large and valuable collection was made in the islands mentioned, and the paper is a detailed description of this collection. It is illustrated with eight beautiful colored plates and several figures in the text. JOHN MURDOCH.

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I am indebted to the Hon. Mr. Lind, of Minnesota, for the information that there are in Minnesota and Dakota bone-heaps, corresponding in structure somewhat to the shell-heaps of the east. The mass was evidently accumulated as refuse around teepees or earth-lodges. The most interesting part of the statement is the immense amount of the débris referred to and the great variety of animals whose bones are mixed together. I have not seen reference anywhere to these bone-heaps, quite significant now that the buffalo have disappeared, and reminding one of the horse-cemetery of Solutré.

O. T. Mason.

NOTES AND NEWS.

THE GROWTH OF A MYTH.—One of the most persistent of the early myths in regard to the American Indians was that of the existence of a tribe of Welsh Indians, the descendants of a colony founded by Prince Madoc about the year 1170. The story is told with a number of romantic details by different writers of the last century, some of whom put the number of the tribe as high as thirty thousand, all speaking Welsh, with Welsh Bibles—although printing was not invented until several centuries after the supposed date of Madoc's voyage—beads, and crucifixes. The different versions bear the earmarks of a common original source, which is probably a work called the Turkish Spy, published some time prior to 1738, when it was quoted by Malcolme in an essay on the Keltic languages. The mythic tribe was first located on the Atlantic coast and was identified with the Tuscaroras, of whom it was asserted that "their language is the same as is spoken by the British or Welsh;" that they were descended from the colony of Madoc, and that "they show his tomb to this day" (*ante* 1738). As the country began to be settled the mythic tribe receded, and about 1776 we find them on the Missouri, somewhere above St. Louis, still speaking Welsh. They were apparently of the Tory stripe, for a few years later, at the close of the Revolution, we find that they had removed seven hundred miles up the Red river. By this time their printed Bibles had changed to parchment rolls, written with blue ink. From the location it is probable that these were the same Indians whom Custer heard conversing in Irish. Later on they are the Mokis, and lastly the Modocs, taking their name from the princely founder of the tribe. Having now crossed the continent, their mission appears to be ended, and as we hear no more of them we may surmise that the miners finally drove them into the Pacific.

The foregoing myths appear to have originated in the following versions, which will serve admirably to illustrate how such myths grow. The earlier account is simple and entirely possible; the other, about thirty years later, is amplified and utterly impossible, and yet is evidently derived from the first. In the Turkish Spy, probably about 1730, it is stated that "a certain Inhabitant of

Virginia, * * * straggling not long ago into the Wilderness, by Chance fell amongst a People, who, according to some Law or Custom of theirs, condemned him to Death; when he, in the Hearing of them, made his Prayer to God in the British (*i. e.*, Welsh) Tongue, upon which he was released."

This may be all true enough, but the Rev. Mr. Beatty, preaching to the rough frontiersmen of that day, saw here a chance to point a moral as well as to adorn a tale, and gives the story thus in 1768: "I have been informed that many years ago a clergyman went from Britain to Virginia, and having lived some time there went from thence to South Carolina; but after some time, for some reason he resolved to return to Virginia, and accordingly set out by land accompanied with some other persons. In travelling through the back parts of the country, which was then very thinly inhabited, he fell in with a party of Indian warriors going to attack the inhabitants of Virginia. Upon examining the clergyman, and finding he was going to Virginia, they looked upon him and his companions as belonging to that province, and took them all prisoners, and told them they must die. The clergyman, in preparation for another world, went to prayer, and being a Welshman, prayed in the Welsh language. One or more of the Indians was much surprised to hear him pray in their own language. Upon this they spoke to him, and finding he could understand them, got the sentence of death reversed, and his life was saved. They took him with them into their country, where he found a tribe whose native language was Welsh, though the dialect was a little different from his own, which he soon came to understand. They showed him a book, which he found to be the Bible, but which they could not read; and on his reading and explaining it, their regard for him was much heightened."

It is worthy of note that there has recently sprung up in the same region of North Carolina a similar myth, by which some five thousand mongrels, calling themselves Croatan Indians, seek to prove their descent from the lost colony of Roanoke. The one myth may have suggested the other.

JAMES MOONEY.

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